AUGUST 15, 1912
VOL. III. NO. 6

SINGLE COPIES, 25c.
ONE YEAR, $2.00

THE COMMERCIAL CAR JOURNAL

Entered as Second-Class Matter at the Post Office at Philadelphia, Pa.

These five Peerless Trucks are in the service of Baugh & Sons Company, manufacturing chemists of Philadelphia.

PEERLESS TRUCKS

THE four Closed-Body Trucks in collecting raw material throughout Philadelphia and delivering it at the Baugh plant, have yielded every important advantage that is claimed for motor truck service.

They cover a larger territory than the teams they displaced. As they make the trips quicker, they deliver the stock in better condition and materially increase its value. Service is continuous, even in the worst winter weather; snow, slush and slippery hills cause no delay. Very hot weather does not impair their efficiency. The system is elastic, for the trucks can work overtime without fatigue. Several less men are employed. The daily average run is 35 to 40 miles.

The Open-Body Truck makes quick deliveries of freight to railroads and steamships, within five miles of the factory, and runs daily about 30 miles. On several occasions it has done work that could not have been accomplished by horses.

Correspondence is invited.

Truck Department
THE PEERLESS MOTOR CAR CO.
Cleveland

PUBLISHED THE 15TH OF EACH MONTH

CHILTON COMPANY

MARKET & 49TH STS. PHILADELPHIA

Standards of Workmanship

Locomobile shop practice is illustrated by the following examples:

The crank shaft is balanced for ***running*** balance on a running balance machine; the connecting rods for each engine are selected and weighed; the pistons for each engine are selected and weighed;—these operations insure the reciprocating parts of the engine having a perfect ***running*** balance. The compression space in each cylinder is calibrated. Pistons and cylinders are ground; all other wearing surfaces are hardened and ground. The tolerance on crank shaft bearings and pins is one thousandth of an inch; on gears, one thousandth of an inch; on pistons and cylinders, one half of one thousandth of an inch.

Every part designed for Heavy Duty Truck
Standards of Workmanship
Quality of Material
Powerful Motor
Five Bearing Crank Shaft
Liberal Tire Equipment
Four Speed Transmission
Wide Faced Gears
Governor Control
Interchangeable Demountable Tires
Large Front Wheels
Strongest obtainable Driving Chains
Chain Cases
Differential Lock
Steel Wheels
Dry Disc Clutch
Sprag
Accessibility of Units

Ignition and Oiling System not subject to Driver's Control

The Locomobile Company of America

Executive Offices and Works:
Bridgeport, Connecticut

Service and Sales Branches:

New York	Chicago	Philadelphia	San Francisco
Boston	Pittsburgh	Minneapolis	Baltimore
Oakland	Atlanta	Los Angeles	Washington

This advertisement is No. 2 in a series descriptive of Locomobile Design and Construction.

This advertisement is No. 2 in a series descriptive of Locomobile Design and Construction.

THE PUBLISHERS' PERSONAL PAGE

PUNCTUALITY IS THE SOUL OF BUSINESS

Truck Efficiency Established

It is surprising how many companies have hesitated before purchasing commercial cars, feeling that it was cheaper to let the other fellow experiment. This attitude shows gross ignorance of the actual conditions which exist, for the practicability of the commercial car was demonstrated more than ten years ago in Europe and fully eight years ago in this country. The firm that does not now use commercial cars, thinking that they are saving money while someone else is experimenting, is simply hoodwinking itself. In other words is blinding itself to the actual facts, and while it is not employing trucks, the so-called experimenters are reaping the harvest and gradually, but surely, establishing their business in districts which the unprogressive user cannot reach with horses.

The Awakening

will come when it is too late, and it is found that the competitor has already established so firm a footing in districts which would be the logical place for an extension of business that "Mr. Doubting Thomas" is already shut out. No business concern today need fear being a pioneer in the use of trucks, this work was done long ago.

Varied Results

To the student of motor delivery, it is not a surprise to find the same make of truck in the same class of service giving entirely different results,—so much depends upon the method of handling. This is true with all kinds of machinery, as any machinery manufacturer will acknowledge, but is very much more true with motor trucks. Results depend upon the driver and upon the system behind the trucks. By that we mean, the delivery system. This includes the methods of loading, unloading, the arrangement of routes, and the care of the machines.

What Do You Know

about the best methods of operating motor trucks in your own business? Do you know what the other firms in your own line are doing with their machines? Are you ready to answer for your own good such questions as these:

Which makes the better driver of a commercial car, a trained chauffeur or an old horse driver familiar with the delivery of your special goods?

Does it pay to put a recording instrument on each vehicle?

Is it best to have the drivers repair and make replacements?

How many and what kind of parts shall be kept on hand for emergencies?

Shall substations be maintained in the suburbs, or shall all the cars operate from a central base?

In your service, are pneumatics or solid tires more suitable on cars up to one ton capacity?—

And numerous other questions are continually arising which must be answered intelligently by the user. If you know all of these things, you will probably be successful; if you do not, to use a slang expression, "It is up to you to get wise." ***Learn these facts now,*** not after you have battered up two or three costly machines. Such a method is extremely expensive and may cost you several thousands of dollars: this information can be had for a $2 bill, which will bring the COMMERCIAL CAR JOURNAL to your desk each month for a year.

Address all subscriptions to the Subscription Department, Commercial Car Journal, Forty-ninth and Market Streets, Philadelphia.

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The Autocar

JOHN WANAMAKER
NOW OWNS
ONE HUNDRED
Autocar Delivery Vehicles

THREE YEARS ago we sold John Wanamaker his first Autocar. His recent order for twenty Autocars is his seventh repeat order to take care of his increased business, which Autocars have helped to develop, by broadening the scope of his delivery territory—and delivering goods promptly.

Our product is endorsed by six hundred and seventy-five leading concerns of the country who own from one to one hundred Autocars each.

"USED IN EVERY LINE OF BUSINESS"

Write for Commercial Car Catalog No. 4C.

The Autocar Company, Factory, Ardmore, Pa.
Established 1897

Sales and Service Buildings

PHILADELPHIA — 23rd and Market Streets
NEW YORK — 428-430 / 435-437 W. 19th Street
BOSTON — Beacon Street—Commonwealth Ave.

Continuous Efficiency Guaranteed

The Commercial Car Journal

VOLUME III | PHILADELPHIA, AUGUST 15, 1912 | NUMBER 6

N. A. A. M. TO HOLD GENERAL MEETING

A MEETING of all members of the N. A. A. M., now numbering about ninety-five leading manufacturers of complete vehicles, including gasoline and electric pleasure and commercial cars, is to be held next fall or winter. This was decided upon at the August meeting of the Executive Committee. The midsummer meeting was held at the summer home of Manager S. A. Miles, at Christmas Cove, Maine. The observation room at the top of a 100-foot tower was used for the meeting, which was attended by ex-President Thomas Henderson, President W. E. Metzger, Col. Clifton, Albert L. Pope, H. H. Rice, R. D. Chapin and Alfred Reeves, of the committee, and S. A. Miles, J. S. Marvin, A. L. Prindle and H. W. Perry, of the N. A. A. M. office.

The proposed general meeting of Association members may be called for the dates in October, when the drawing for allotments of space at next February's Chicago Show is held in New York.

Considerable attention was given to the subject of next winter's shows. St. Louis was removed from the local show circuit, because the dealers' show in that city is held in October, instead of in the winter, and the dates would not fit in with others in the N. A. A. M. show circuit, decided upon last spring by the Executive Committee.

Plans for next winter's Chicago show, already well under way both at Manager Miles' tower office in Maine and the decorators' in Chicago, were discussed, but the arrangement of spaces was left to the discretion of the manager.

In the absence of S. D. Waldon, chairman of the Commercial Vehicle Committee, the secretary of the committee reported that sentiment of the score of motor truck manufacturers who had been sounded with regard to the proposal to hold a midsummer truck show in 1913 seemed to be about equally divided for and against the idea. A lively discussion followed, in which it was pointed out that an outdoor exhibition, which might be held in early summer or early fall, in combination with demonstrations of the vehicles engaged in various services, would have important advantages. This might or might not take the place of the midwinter shows as heretofore held, and could be carried out in some central city as Detroit or Indianapolis. Various loading and unloading methods designed greatly to economize time and keep the truck moving the maximum number of hours in a working day could be arranged with a view to showing business men how motor trucks can be made more economical and successful in different lines of business.

The secretary of the Commercial Vehicle Committee was instructed to obtain as much information as possible with regard to the views of member companies as to the advisability of such a show, and to report at the next meeting of the Executive Committee.

Reports of progress in the matter of a standard caution plate for commercial vehicles showed that a design has been approved, and the making of sample plates ordered. It is expected that they will be ready for distribution soon, so that each manufacturer can order the quantity he desires with his own name and location on them.

Albert Pope, chairman of the Traffic Committee, made a report of progress in connection with freight rates, and also on insurance on motor trucks. The insurance matter had been referred at the last meeting to Mr. Marvin, manager of the Traffic Department, who had attended a meeting of a committee on rates of the Automobile Underwriter's Conference, which is considering a reclassification of rates on commercial motor vehicles. As a result of this meeting, it developed that the underwriters find from their own experience that the fire hazard is greater when a truck is on the road, than when it is in the garage, and the committee now proposes to base the insurance rates for fire largely on the number of hours that trucks are usually on the road in different lines of business.

COMMERCIAL CAR SHOW AT NEW YORK

The Automobile Board of Trade at its quarterly gathering in New York City listened to the report of the Show Committee, covering plans for the big exhibition of next January, which will be conducted in two buildings, Madison Square Garden and Grand Central Palace, a single admission covering both buildings.

The pleasure car show will be held from January 11 to 18, and the commercial car show from Monday evening, the 20th, to Saturday evening, the 25th.

Suitable resolutions were passed on the death of Alfred N. Mayo, of the Knox Automobile Company, one of the oldest members of the A. B. T. and a leader in the industry since its inception.

It was also voted to begin compilation for the publication of the 1913 hand book.

Porto Rico has passed a law by which the speed of commercial motor cars is regulated in proportion to the size or weight of the car. That is, a six-ton truck can travel at a maximum speed of 10 miles per hour, and other sizes at proportionate speeds. All commercial cars must be marked on both sides in letters not less than 2 in. high with the carrying capacity in tons and the maximum speed in miles.

GENERAL MOTORS COMPANY, Detroit, Mich., has had such a satisfactory season that it has anticipated the payment of the installment on its first mortgage notes, which falls due on October 1st, $1,000,000 having been paid over to the Central Trust Company, of New York, for this purpose. Its business for the year amounted to over $65,000,000.

NEW FACTORIES AND TRUCKS

WILL BUILD FIVE-TON TRUCK

A five-ton truck is contemplated by the Lewis Spring & Axle Company, of Jackson, Mich. The model car has been on the road for some time past, and is said to work very satisfactorily. Thomas Lewis, of the company, stated that the car might possibly be made by a separate concern, but that the Lewis organization was back of it. It is equipped with a four-cylinder motor, 4¾ x 5 in., a multiple disc clutch, three speed transmission, with final drive through internal gears. The application of this form of drive in the new car is different, it is said, from anything now on the market. Manufacture of the new cars will begin shortly.

Torbensen Gear & Axle Company, formerly of Bloomfield, N. J., have moved into a new factory at 216-224 High Street, Newark, N. J.

Nyberg Auto Works, The, of Anderson, Ind., will hereafter manufacture trucks on a large scale. The Nyberg trucks will have a 3000 lb. capacity, and will sell for $2000.

Ross Gear & Tool Company, Lafayette, Ind., is erecting a new building with 50,000 sq. ft. of floor space, to manufacture steering gears and differentials for commercial vehicles.

Universal Motor Truck Company, Portland, Me., has been incorporated with $10,000 capital, by Clarence E. Eaton, President; T. L. Croteau, Treasurer; James E. Manton, Clerk.

The Locomobile Company of America, Bridgeport, Conn., has commenced the erection of a new building which will be devoted entirely to the production of commercial cars.

W. S. Motor Truck Manufacturing Company, Newark, N. J., has been incorporated to manufacture motor vehicles by J. M. Woods, C. H. Tebbetts and L. T. Fetzer, with $300,000 capital.

Ford Motor Company, Detroit, Mich., has purchased a plot, 160 x 591 ft., on the east side of Wabash, extending from 39th S. to 40th Street. It is stated that a large assembling plant will be erected on this plot.

General Vehicle Company, Long Island City, N. Y., well-known makers of the G. V. Electric Commercial Cars, has secured the American rights to manufacture the Mercedes-Daimler commercial cars.

Westfield Motor Truck Company, Westfield, Mass., has been incorporated with $100,000 capital to manufacture a 1500-lb. delivery wagon, and a one-ton truck. W. F. Magill, president; P. N. Hall, J. A. Graham, chief engineer.

Motor Truck Company, 407 Rosabel Street, St. Paul, Minn., S. L. Buchanan and T. D. Levering, proprietors, has purchased the lease of the Genge Power Vehicle Company, to the premises at 353 Main Street, and plan to establish a large commercial vehicle business.

Universal Motor Truck Company, Detroit, Mich., which it was reported was to go into the merger of the Metzger and Flanders Companies, have cancelled the option which had been granted to Walter Flanders on the business. It is stated that the company will be capitalized at $1,000,000 for the production of a one-ton worm-driven truck.

Western Motor Company, of Marion, Ind., in which George W. Bowen, of the Bowen Manufacturing Company, of Utica, N. Y., purchased a large interest, has been succeeded by the Rutenber Motor Company, a new corporation, with a capital stock of $1,350,000. Mr. Bowen is president of the new company.

Fisk Rubber Company, Chicopee Falls, Mass., is erecting two new buildings, one 250 x 90 ft., six stories and basement, another 200 x 60 ft., four stories and basement. Necessary rubber machinery, boilers and engine for the power plant are to be installed, which will increase the present capacity about 50 per cent.

Lion Motor Truck Company, Pittsburg, Pa., has been succeeded by the Pitt Motor Car Company, which was organized to take over the Lion Company. The officers of the Pitt Company are: E. P. Douglas, president and manager; J. E. Douglass, treasurer and W. F. Phillips, secretary. The company is making one and two-ton trucks.

Stewart Motor Corporation, Buffalo, N. Y., has secured the big plant formerly occupied by the Niagara Machine & Tool Works, and has remodeled it to suit the purpose of manufacturing commercial motor cars. This plant gives the company a capacity of about 1500 light trucks per year, and is conveniently situated to railroads, etc.

New Incorporations and Increases

Toledo Motor Truck Company, Toledo, O., has been incorporated with a capital stock of $95,000, and has taken over the Rassel Motor Car Company.

Munsing Tractor Company, 30 Church Street, New York City, has been incorporated with $600,000 capital stock, to produce the Munsing tractor, a three-wheeled vehicle designed to convert horse trucks into motor vehicles.

The Brown Motor Truck Company has just been formed at Peru, Ind. William H. Brown, formerly president of the Mace Motor Truck Company, will be at the head, and Carl H. Wallrich is vice-president. The plant will be in operation in the near future.

Republic Rubber Company, Youngstown, O.—At the special meeting, on August 1st, the stockholders voted an increase of the authorized capital from four million to ten million dollars. A number of extensions and improvements were discussed, and the semi-annual statement was read, showing a large increase in the business of the company.

Duquesne Motor Car Company, Pittsburg, Pa., has been organized with $250,000 capital and has leased the factory at 30th & Liberty streets, Pittsburg, where pleasure cars and commercial cars will be manufactured. The officers are W. L. Rogers, president; R. F. Ramsey, treasurer; Frank H. Moore, formerly of the Kissel Car Company, engineer and Oscar J. Houck, formerly with the Lozier Company, designer.

Simms Magneto Company, Bloomfield, N. J., has been reorganized and the capital has been increased from $1,000,000 to $1,750,000. C. G. Stoddard, formerly of the Dayton Motor Car Company, has been elected president. A. A. Fisher, of the Assets Realization Company, treasurer and F. R. Simma, H. J. Edwards and H. M. Kilborn are directors. The new company has ample capital at its disposal and will make an active bid for business at a very early date.

PERSONAL MENTION

GEORGE W. YEOMAN

Formerly Sales and Advertising Manager of the Continental Motor Manufacturing Company, and who has recently accepted the position of Vice-President and General Manager of the Ames Motor Car Company, of Owensboro, Ky.

FRED A. CROOKS has been made sales manager of the New York branch of the American Locomotive Company.

J. T. LANGHORN has resigned as manager of the Truck Department of the Packard Motor Car Company, Detroit, Mich.

ERNEST VAN TOFF, Pittsburg, Pa., has been secured as chief engineer by the Pitt Motor Truck Company, of Pittsburg, Pa.

D. K. MCBRIDE has been promoted from office manager to factory manager of the Universal Motor Truck Company, Detroit, Mich.

FREDERICK F. COLVER has been appointed manager of the truck department of the New York city branch of the Locomobile Company, of America.

ERNEST COLER has been promoted to the position of manager of the Advertising Department of all the John M. Willy's pleasure and commercial car factories.

JOHN R. STILES, for some time identified with the sale of Kelly trucks, has accepted a position as sales manager for the same trucks with Cowles Tolman, New Haven, Conn.

GEORGE L. EAST, formerly advertising manager for the Olds Motor Works, has been appointed in the same capacity for the Amplex Motor Car Company, Mishawaka, Ind.

G. W. FLAVIUS SUDROW, Dayton, O., has resigned as sales manager of the Apple Electric Company to become sales manager of the Marion Motor Car Company, of Indianapolis.

H. L. WINTER, Detroit, Mich., has resigned as sales manager of the Federal Motor Truck Company, of Detroit, and will take up similar duties with the Universal Motor Truck Company, of the same city.

H. W. EVANS, formerly connected with the San Francisco branch of the Locomobile Company of America, for the past two years, has been placed in charge of the truck business of the company on the Pacific coast.

L. C. SMITH, formerly of the general advertising staff of the General Motors Company, has been appointed advertising manager for the Olds Motor Works, with headquarters at the factory.

W. B. WILLIAMS, assistant sales manager and advertising manager of the American Motors Company, of Indianapolis, has been advanced to the position of advertising and publicity manager.

R. W. INGERSOLL, formerly with the Firestone Tire & Rubber Company's Buffalo branch, has been appointed sales manager of the Stewart Motor Corporation, makers of the Stewart trucks.

H. W. TAYLOR has been appointed general manager of the truck department of the Philadelphia branch of the General Motors Company, 664 N. Broad Street, Philadelphia.

W. P. ABBEY, formerly with the Gramm Motor Truck Company, Lima, O., has been appointed sales manager of the Bowling Green Motor Car Company, Bowling Green, Ohio.

CHARLES B. SHANKS, Tacoma, Wash., has joined the forces of the Kelly Motor Truck Company, and has charge of the western territory, which includes Washington, Oregon and California.

WILLIAM F. SCHMELTZ, formerly with the Detroit Steel Products Company, has been appointed special sales representative of the Poss Motor Car Company, to travel in Ohio, Indiana and Kentucky.

GEO. A. HORNER, formerly general manager of the Rapid Motor Vehicle Company, Pontiac, Mich., has been made general manager of the Grabowsky Power Wagon Company by the creditors' committee.

CHARLES B. FOSTER, formerly president of the Foster & Richardson Beadstead Company, has acquired a large interest in the Morgan Motor Truck Company, and has assumed a presidency of that company.

F. A. HENDERSON, Akron, O., has reached San Francisco, Cal., where he joined the San Francisco branch of the Goodyear Tire & Rubber Company, as special representative of the motor truck tire department.

M. R. PAIGE, formerly sales manager of the Moline Wagon Company, Moline, Ill., has accepted a position with the Velie Motor Vehicle Company's Boston branch, taking charge of the Commercial Department.

C. W. NASH, Vice-President and General Manager of the Buick Motor Company, of Flint, Mich., has been also appointed Vice-President of the General Motors Company, to fill the vacancy caused by the resignation of W. J. Meade.

J. A. ROGERS who has been manager of the American Motor Truck Company for the last year and a half, and his associates have organized a new truck company, which will be known as the Chase Motor Sales Company, of Philadelphia.

FRANK BRISCOE, one of the vice-presidents of the United States Motor Company, has resigned. He has sailed for Europe, to make a study of European motor car engineering. He will continue as president of Briscoe Manufacturing Company.

GEORGE A. CRANE, formerly with the Knox Automobile Company, and also the United States Motor Company, has been secured by the Locomobile Company of America to take charge of the truck business in the territory controlled by the Chicago branch.

JOHN H. VALENTINE, Syracuse, N. Y., head of the company bearing his name, and which has had the agency for Chalmers cars in Syracuse, N. Y., has retired from the concern, and is now connected with a Rochester, N. Y., company interested in the manufacture of motor trucks.

Edw. H. Habersham, formerly connected with the Studebaker Corporation's sales department at the factory, has been appointed manager of the Washington, D. C., branch. This branch will hereafter be known as the Studebaker Corporation instead of the former title of E-M-F Washington Company.

J. F. Corl, Detroit, Mich., has resigned from the Rapid Motor Vehicle Company, to become western district manager of the Chicago office of the General Motors Truck Company. Gleason F. Murphy, vice-president and general manager of General Motors Truck Company, succeeds Mr. Corl as manager of the Rapid Plant.

Carter M. Bacon, Providence, R. I., formerly inspector for the American Locomotive Company, in Providence, R. I., also connected with the Berkshires Automobile Company, Pittsfield, Mass., has accepted a position with the Packers Motor Truck Company's New York branch, and will make weekly inspection of their trucks throughout the territory operated by the New York branch.

NEW BRANCHES

Packers Motor Truck Company, Wheeling, W. Va., has opened a New York office at 1784 Broadway.

General Motors Truck Company, Detroit, Mich., has leased the building at 1121-23 Locust Street, St. Louis, Mo., for a branch house, with O. E. Stoll as local manager.

Charles A. Malley, of Boston branch of Universal Truck Company, has leased building at 146-150 W. 63d Street, New York City, N. Y., to be used as service station.

Universal Motor Truck Company's service station, mentioned in our last issue as being in Detroit, Mich., is located at 26th Street & South Park Avenue, Chicago, Ill.

Willys-Gramm Motor Truck Company's branch, Lima, O., formerly the Gramm plant, is to be enlarged in the near future, but plans for the addition and alterations have not yet been completed.

Gasoline is more powerful than Oats

Financial Affairs

Wishart-Dayton Auto Truck Company, New York City, has had a petition in bankruptcy filed against it, and an execution of $961.02 has been issued against George Wishart, its president, in favor of the Farmers' Bank, of Canada.

Van-L Commercial Car Company, Grand Rapids, Mich., has been adjudicated a bankrupt in the Federal Court. Kirk E. Wicks has been appointed referee. This was done to prevent the transfer of its assets to the Commercial Service Truck Company of the same town.

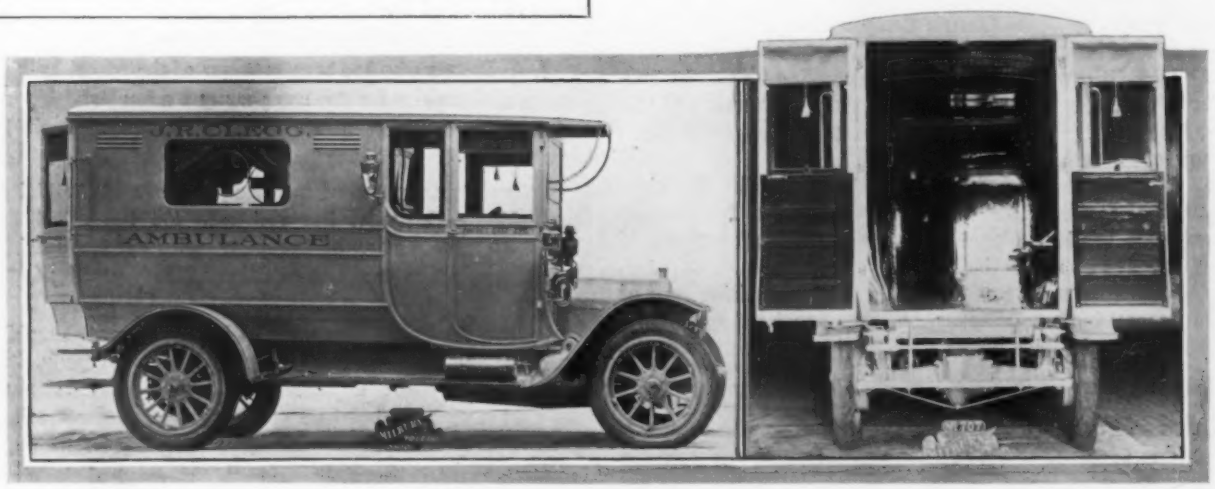
Universal Truck Company, of New York, which was recently absorbed by the Universal Motor Truck Company, of Detroit, and subsequently operated as a branch house, has been sued by George Wheeler, formerly treasurer of the company, who claims that the transfer to the Universal Motor Truck Company, of Detroit, was illegal.

Mais Motor Truck Company, Indianapolis, has been placed in the hands of Franklin Vonnegut, as receiver, on the application of Edw. King, contractor. W. H. Brown, president of the company, has organized a new company in Peru, Ind., under the name of the Brown Commercial Car Company.

Receiver has been authorized to sell the company's property and business on August 10th. Terms of sale will be one-third cash; one-third in 12 months and one-third in 18 months, deferred payments to bear 6 per cent.

Lippard-Stewart Motor Car Company, Buffalo, N. Y., has built five panel body delivery cars of 1500 lbs. capacity each for the Hoefler Ice Cream Company, of Buffalo. The floor of the bodies is lined inside with zinc to prevent salt water from leaking down on the mechanism. Over this zinc is a removable oak grating, on which the freezers are set.

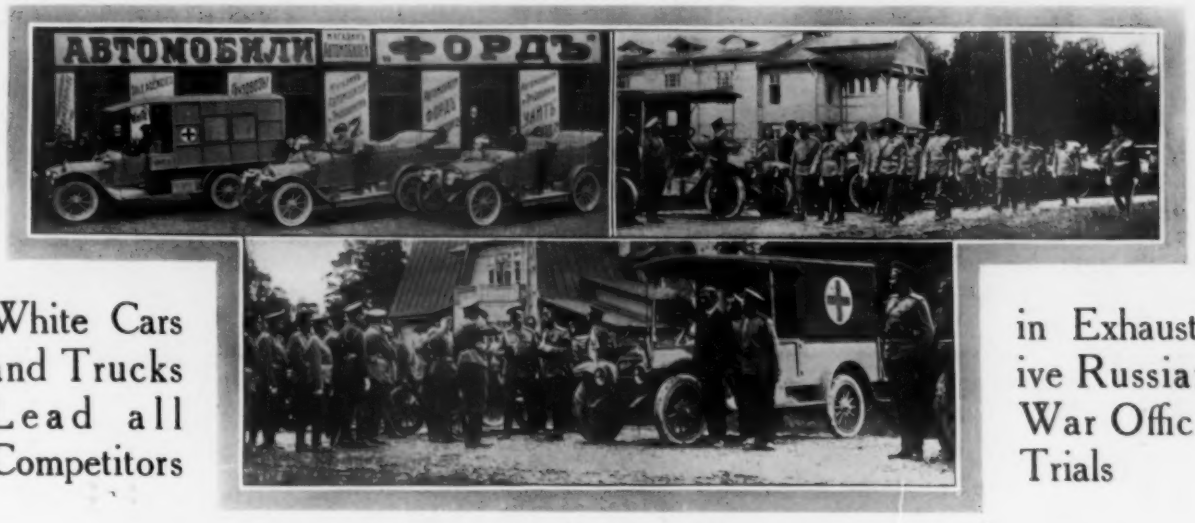
The Worcester Electric Light Company, of Worcester, Mass., has established a garage for handling its own electric trucks, as well as those of the public. This company also supplies exchange batteries for gasoline cars for lighting purposes, and does a general repair business.



A Novel Design of Ambulance Body

The illustration shows two views of an ambulance body built by the Milburn Wagon Company, of Toledo, Ohio. Attention is called to the construction of the front end of the car. This is enclosed so that the attendant and driver are fully protected in inclement weather. The body is finished on the inside in solid mahogany. The body itself is made of wood. The inside is large and roomy with plenty of head room. It is heated for winter use. The heat can be regulated to a nicety, and is obtained from a chamber which surrounds the exhaust pipe and muffler. This gives a current of warm fresh air which passes through the floor and out of the ventilators in the sides of the body near the top.

White Cars and Trucks Lead all Competitors in Exhaustive Russian War Office Trials



Russian Government Tests Army Motor Vehicles

The upper left view shows part of the contesting White Squadron at the start of the Russian War Office Trials. Note the equipment of the touring cars, also the body design of the field ambulance. The upper right view shows His Imperial Majesty inspecting the victorious White outfit. In the lower view is shown Czar Nicholas II, of Russia, inspecting one of the White ambulances at Peterhoff, at the finish of the trials. The Czar is standing just at the right of the telegraph pole. The third figure to the left of the pole is General Suchomlinoff, Minister of War. The officer standing at the Czar's right is General Dobrecshin, who was in command of the trials.

To determine the adaptability of motor vehicles for army service in all of its branches, the Russian Government held a reliability run which for difficulty and exacting conditions has never been approached.

The route covered started at St. Petersburg, circled around through Moscow, and then returned over a different course to the Russian capital, the entire distance traversed amounting to about nineteen hundred and sixty English miles. The road conditions were indescribable. In many places there were no roads at all, the course being across sand hills, over fields and ploughed ground, and through forest trails. The best idea of the travelling conditions can be gained from the fact that it was necessary to precede the tour by a detachment of army bridge-builders in order to make it possible for the cars to get through at all.

Forty-five cars and trucks started from St. Petersburg on June 6th. The flower of European motor vehicle production was represented by Mercedes, Benz, Napier, Saurer, Adler, Clement, Lancia, Berliet, Charron, Laurin, Buire, Vauxhall, and others. The American "White Squadron" was made up of two five-passenger thirty horsepower touring cars, two thirty horsepower field ambulances, using the regular White three-quarter ton capacity truck chassis, and one 1½ ton capacity thirty horsepower truck, fitted with tank body for carrying the fuel supply for the tour.

The trials ended in St. Petersburg on June 23rd, after seventeen days of the hardest service to which motor vehicles have ever been subjected. The last three day's run was made at high speed over hard, rough roads, and was extremely exacting. Thirty-five cars finished the trip, among which were the five White contestants, with the record for a lower consumption of gasoline and oil than any of the European cars.

All five Whites went through the entire trip without mechanical trouble of any description, and created the most enthusiastic admiration among the Russian officials who supervised the trials. At the close of the run, all of the surviving contestants were assembled at Peterhoff, where they were personally inspected by the Czar of Russia, the Minister of War, and the high officials of the Russian army.

After the royal inspection, all of the contesting cars were completely dismantled and every part was subjected to the most careful scrutiny for wear and deterioration. The commission of experts who conducted this examination reported that every one of the five White cars and trucks was in excellent condition. This report was followed by the report of the army officials that the White cars were highly suitable in every respect for the requirements of the Russian Army service, and recommended that the entire five cars be purchased by the War Department. The next day the victorious "White Squadron" became the property of the Government of Russia.

Moving a House by Motor Truck

The illustration shows how the Krueger House Moving Company, of Chicago, moves houses. Wherever the conditions allow, this company mounts the houses upon three heavy, four-wheel trucks, a kind of three-point suspension, and tows the entire house with a six-ton Mogul truck. The truck is well loaded to produce sufficient traction. The company states that it is not difficult to tow the house over hard roads, and that with the truck a much better speed is obtained than with the horse and windlass.

Transcontinental Alco Nearing End of Route

At this writing the Alco truck of Charles W. Young Company, Philadelphia, with its 3 tons of Parrot Brand, Olive Silk Soap, baggage, planking, ropes, shovels, etc., making a load of 3½ tons, is nearing Salt Lake City, Utah. The progress of this truck has been watched with keen interest by not only the automobile and commercial car industries but by the public in general. The crossing the continent by automobiles has been frequently accomplished and varied with the type of bridge construction. Near Laramie, Wy., the heavy rains had washed away bridges and turned the trail ahead into a sea of almost impassable mud. The crew was fortunate enough to cross one bridge between Fort Collins and this city before it was destroyed by a cloudburst. Approaching Hanna, Wy., the Transcontinental Alco encountered roads submerged under two feet of water and many bridges to the west washed out. At best the Wyoming roads are

Obstacles Encountered by Transcontinental Alco

In the upper left view the Alco can be seen running through a field, this being necessary on account of the bad roads and hills encountered outside of Elbridge, N. Y. The upper right view shows a bridge near Sterling, Colo., which had been inspected by the crew but proved to be burned in hidden parts, and consequently proved fatal to the truck. The lower left view shows the trail of the truck after a heavy rain. There were ten cloudbursts in eight days in the Wyoming country. In the lower right view can be seen the deep alkali mud wrapped around the wheels of the Alco truck, in storm-swept sections of Wyoming.

now we have a motor truck carrying a consignment of goods to Carlson-Currier Soap Mill, Petaluma, Cal. These efforts must result in good roads action in the various western states where the roads in the wet season are all but impassable, and the sportsmanlike action of Charles W. Young in sending this pioneer shipment must be commended.

The experiences of the Alco truck along the Iowa Official Transcontinental Route were many and varied. In the trip across Iowa over five hundred bridges were examined and no less than one hundred were given some kind of attention. Replanking, reconstructing and strengthening worn flooring together with supporting weak stringers with boxes of soap from the cargo, were obstacles encountered and overcome by the crew. The method of repair employed in each case known to be perhaps the most difficult in the country to traverse. The abominable condition of the roads due to floods proved an additional test of the truck's mechanical construction. Along the way to Wamsutter the crew was forced to drive across gullies so abrupt that the truck in crossing at times dipped to an almost vertical position, with the front tires on the upper bank and the rear tires on the lower bank. Up to this point the truck had covered more than two-thirds of the distance from Philadelphia, with much of the roughest part of the journey behind it, but still hundreds of miles to make, with many bad roads to negotiate. From Salt Lake City the route leads to Reno, San Francisco and Petaluma, where the load of merchandise will be delivered to the Carlson-Currier Soap Mill.

Trucks and knowledge bring bread and honor

THE COMMERCIAL CAR JOURNAL

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A FALL COMMERCIAL CAR SHOW

SINCE our proposal to the automobile manufacturers and the trade that the commercial car industry is now ready and able to stand on its own feet and should have an entirely separate and distinct show to be held preferably in the fall, the matter has been taken up by the national body, the N. A. A. M.

Opinions have been asked of various manufacturers and clubs on the advisability of holding a separate summer commercial car show. Unfortunately, however, the N. A. A. M. has already scheduled a truck show to be held in New York City this coming winter. It naturally follows that if the makers voted in favor of such a summer truck show, as proposed by the N. A. A. M., they would be voting to have two shows instead of one, unless the winter show is abandoned. In view of these facts, it is not surprising that the report has been sent out that there is a division in the trade in regard to the matter.

Before the COMMERCIAL CAR JOURNAL proposed a separate and distinct fall show of commercial vehicles, a canvass was made of the manufacturers, and it was found that the majority were heartily in sympathy with such a movement, provided the winter show was abandoned. We wish it distinctly understood that we are advocating one and only one national commercial car show for the year, and that to take place during the fall and to include open air features and arrangements which will permit of effective demonstrations. We are emphatically against imposing an additional burden on the entire trade by having a large summer exhibition in addition to the winter show.

We feel that the majority of the manufacturers when they voted on the question as put by the N. A. A. M. had in mind, a summer show in addition to the existing winter show, already scheduled for the coming season. As one of the originators of this movement, we would like to see a vote for or against a national truck show, neither in the midsummer nor in the winter, but in the fall of the year, this show to entirely supersede and take the place of the usual winter commercial car show.

The suggestion is herewith made that the N. A. A. M. put this to a vote, and that the questions be so clearly stated that there can be no doubt as to the points at issue. The questions are as follows:

Are you or are you not in favor of two shows, one in the winter and the other in the summer?

Are you or are you not in favor of one and only one national show?

If in favor of only one national show, at what time of the year should this be held?

In what city should such a national demonstration take place?

It is imperative that some decision be reached in the very near future, in order that suitable plans can be made for the coming year, and we trust the N. A. A. M. will accept this suggestion and put the matter to a vote at the very earliest opportunity.

TRUCK MAKERS IN PART TO BLAME FOR OVERLOADING

TRUCK manufacturers, we do not say all truck manufacturers but many of them, are not consistent. They are very strenuous as regards the overloading of their product, but when it comes to actual payloads they are strangely oblivious of the fact that they themselves are the cause of much overloading, in fact it might be said, advocate it. We refer to the practice which is prevalent among truck makers of ignoring the weight of the body of the truck when rating it.

It is a gross error to rate all finished cars on a certain chassis as trucks of the same capacity, for the very evident reason that the bodies are of all types, sizes and weights, and in themselves constitute loads, as far as the chassis, tires, etc., are concerned, and these are the parts usually considered when the manufacturers kick about overloading. For instance, here is a chassis upon which the maker places to-day a platform stake body which does not weigh over 300 pounds. To-morrow on the same identical chassis he puts a complicated power dumping body which with gear shafts and chains will weigh close to a ton, yet both of these machines with the bodies on, go out as five-ton trucks. Naturally, the user puts on a five-ton load and perhaps more. The stake body truck is all right but how about the other machine which already has a ton load in the shape of body; it is really carrying 6 tons. One will stand up all right, while the other soon shows the effects of use, gives trouble all the time, and the owner is continuously

in hot water with both the manufacturers and the tire people. All of this is due to the mistake the manufacturers are making of guaranteeing their cars to carry a certain rated load regardless of the weight already imposed by the body.

It may be impossible to entirely do away with overloading, but one thing is certain, that this unnecessary overloading now caused by the improper and foolish method of rating in use by many makers, can be entirely eliminated. The new warning tag to be placed on trucks provides for body weights and will undoubtedly assist in bringing about a more uniform practice among the makers.

The chassis only should be the basis for the rating, and this statement holds just as long as bodies varying from three hundred pounds up to a ton, are employed on the same chassis. With a standard practice of rating the chassis and counting in the body weight as a part of the load, overloading the chassis will not be caused by the makers. It seems but the course of wisdom, first to get the rating correct, and then see that this rating is not exceeded. At the present time the rating itself makes possible an overload to begin with, and the most careful user, even though he conform to the manufacturer's desires, is then overloading the chassis. This is a question for the N. A. A. M. to refer to such an engineering body as the S. A. E., and the standardization of the method of rating is as important as standardizing many of the mechanical details. We trust this suggestion will bear fruit in the near future, and will at least put an end to overloading which is caused by the makers themselves.

TRUCK EFFICIENCY LIMITED BY SURROUNDINGS

The cold dollar-and-cents business world has for several years been weighing the commercial car, and from the tremendous increase in the number of vehicles used, its verdict has evidently been favorable. The truth of the matter is that the present commercial car is very much more efficient than can be shown in the antiquated and inadequate surroundings in which it is placed. The trucks are new, up to date and eminently efficient; the alleys, pavements, loading platforms, the freight terminals, traffic regulations, etc., are woefully inefficient and of a by-gone age.

The business men, municipal authorities, architects, and even many of the engineers have not yet aroused themselves to meet the entirely new conditions which accompany the wholesale adoption of motor delivery. Instead of taking their medicine like men, they have too often attempted to legislate heavy traffic vehicles off of the streets, or in other ways hamper the progress of civilization. It is absolutely useless to try and stop the introduction and use of eight, ten and twelve ton vehicles, and this should not be attempted. The cause of progress calls for improvements in streets, buildings and traffic regulations commensurate with the wholesale method of handling the transportation problem, offered by the modern commercial car.

In the live and progressive cities the pavement is being reconstructed, manholes redesigned, and the traffic regulations altered and adjusted to meet the new conditions. The live architects are building with accommodations for the future and the approaches, doorways, elevators, etc., of their structures show that the largest motor trucks have been taken into consideration in the design. It is unfortunate that so efficient a mechanism as the modern motor truck should be so handicapped and prevented from fulfilling its highest usefulness because of inadequate roads, terminal stations, freight yards, loading and unloading appliances, etc.

These are the conditions which hamper and retard further progress, not the design of the truck itself, for machines are to be had which are practically above reproach. Let the business man, the architect, the lawyer, and those connected with the municipal governments take notice and legislate and build accordingly.

CONVENTIONS OF THE NEAR FURTURE

The list of conventions given below is to be published each month so that commercial car manufacturers can communicate with the proper authorities with the idea of arranging to give lectures, illustrated talks, statistics, etc., to show the advantage of motor trucks in these various lines.

August 20-22—Vermont Funeral Directors' and Embalmers' Convention, Brattleboro, Vt.

August 20-23—State Convention of the Rural Carriers, Fremont, Ohio.

August 21-22—Oklahoma Master Bakers' Association Convention, Guthrie, Okla. Wm. Ackene, Alva, Okla., Secretary.

August 21-23—Indiana League of Post Masters' Convention, Marion, Ind. E. A. Bush, Reynolds, Ind., President.

August 27—Trans-Mississippi Commercial Congress, Salt Lake City, Utah. A. C. Trumbo, President. Edwin J. Becker, Secretary.

September 2-3—Kansas Rural Mail Carriers' Association convenes at Hutchinson, Kan.

September 3-4—Maine Undertakers' Annual Convention, Falmouth Hotel, Portland, Me.

September 4-6—Convention of National Association of Post Masters, Atlantic City, N. J.

September 9—The 93rd Convention of the National Association of Cotton Manufacturers, to be held at The Griswold, Eastern Point, New London, Conn.

September 9-12—Annual Convention of Illinois Retail Liquor Dealers' Association, Peoria, Ill. Ernest Kunde of Chicago is president and M. J. McCarty of Chicago is secretary.

September 16-18—National Association of Supervisory Postoffice Employees Convention at Memphis, Tenn.

September 17-20—League of American Municipalities Convention, Buffalo, N. Y.

September 23-25—Annual Convention of Wisconsin State Association of Bakers, Sheboygan, Wis.

September 23-28—Annual Convention California Municipalities, Berkeley, Cal.

September 24-26—Kansas State Association of Bakers will convene at Kansas City, Kan.

September 26—National Firemen's Convention, Springfield, Ill. Thos. R. Johnson, Chicago, President. Bert Fisher, Chicago, Secretary.

September 30-October 5—American Road Congress Convention, Million Dollar Pier.

October 22-24—Annual Convention of Nebraska State Association of Bakers, Grand Island, Neb.

October 23-24—Convention of New York State Real Estate Dealers' Association at Binghamton, N. Y. Frank L. Danforth, Buffalo, President. John Shaw, Binghamton, Chairman of Committee.

December 3-6—American Road Builders' Association Annual Convention, Cincinnati, Ohio.

Disguise our bondage as we will,
'Tis horses, horses retard us still.

MOTOR TRUCK BRINGS BUSINESS EXPANSION TO SMALL CONCERNS

By Charles H. Spencer, of the Autocar Company, Ardmore, Pa.

It is not simply the large business concerns who can profitably use motor trucks. Abundant evidence of this is seen in the experience of small houses who are expanding their business and covering new territory by the purchase of power vehicles and the turning of their wagon drivers into chauffeurs.

How rapidly the small but progressive merchants are adopting motor delivery and transportation is shown by the increasing number of cars which the Autocar Company is selling these men.

Among their list of users there are now scores of business concerns of moderate resources—laundries, groceries, bakeries, butchers and the like, whose purchase of one car has resulted in immediate business growth. In many cases, as these men state, this growth has exceeded their highest expectations.

Old Argument Fallacious

The motor truck used to be considered out of the reach of the small merchants. "It is all right for the big fellows to install trucks," these men would declare. "They have to do things on a big scale. They have large plants, they get skilled men to take care of their cars, they build their own garages, buy gasoline at reduced rates, and profit all along the line by the cost reductions that are possible to transactions in volume."

There seems plausibility and business discretion in this argument until it is analyzed and examined, then it will be found that like nearly every proposition which is opposed to progress, it is based on unsound reasoning. The business man who resigns himself to a small volume of business, and is not concerned in installing facilities for handling an increase is never likely to get the increase.

Motor Trucks Get the Business

Some more enterprising rival, who is on the alert to grasp opportunities and who is unwilling to limit his field of action to the small radius permitted by horse and wagon, is going to get out and land the business.

The city merchant not equipped with the commercial vehicle is now finding himself compelled either to abandon the effort to do big business in the suburbs or to expend a sum of money on horses that consume his profits and makes his venture unprofitable. This condition of affairs is forcing the adoption of the motor truck, which knows no fatigue and is impervious to the dangers of slippery streets in winter and hot sun in summer. It is only subject to wear and tear when actually doing the work for which it was purchased.

Left in the garage for months during a season of poor business, it is not suffering the slightest depreciation. Its motor is as good as ever, its tires are not being consumed. There is no loss whatever.

Chauffeurs Easily Trained

Many business men are deterred from buying motor trucks by the fear that their wagon drivers cannot learn to be chauffeurs. There is no more intelligence required to operate and take care of a car than to take proper care of a horse. The Autocar Company conducts schools for drivers at its service buildings, Philadelphia, New York and Boston, and it is their experience that the average teamster can readily be educated to operate a car.

New York has more power vehicles than any city in the country. A greater percentage of the chauffeurs are men who drove horses before the truck began to take its commanding place. In the congested streets of the metropolis chauffeurs deal with conditions more difficult than anywhere else. Yet, statistics of violent deaths in New York City show that a greater percentage are resultant from the horse-drawn vehicle than the motor cars.

Of course, there are degrees of skill. One man is going to get better results than another, and it is essential that before the truck be entrusted to the hands of the former driver of the horse-drawn team he be properly drilled into some vital truths regarding his obligation to properly care for the machine.

But give us a wagon driver of average intelligence, and in a short time we can make of him an efficient and economical driver of a motor truck.

ELEVATOR OPERATED BY TOURING CAR

J. F. Stewart, manager of the Walnut Street Garage Philadelphia, believes in getting his money's worth out of his little Regal touring car. A large addition to the present garage is now being built, making the capacity over one hundred cars. When the problem of getting bricks and mortar to the upper floors came up, Mr. Stewart made use of his car in the novel way of an elevator hoist. A rope was attached to the elevator, passed over suitable pulleys at the top and bottom and attached to the rear axle. Running the car about 60 feet is sufficient to bring the elevator to the second floor, and each day the machine is so used at intervals, totaling about three or four hours' work. Only about 5 gallons of gasoline are used in three days for this purpose, and Mr. Stewart says that he is saving himself in the neighborhood of $60 a week, as he is able to do away with about five hod carriers. At night the car is unhitched in a minute and takes Mr. Stewart home. In the same way, during the day, it can be disconnected at any time and used for other purposes.

Regal Touring Car Operating an Elevator

This car, using about five gallons of gasoline every three days, has done away with the necessity for about five hod carriers, by hoisting brick and mortar on the elevator, to which it is attached. When not working as an elevator hoist, it is used in the ordinary way.

Systematic Study of Commercial Car Transportation

Massachusetts Institute of Technology Studying Commercial Car Conditions in Some Twenty Cities; Valuable Data on Electric, Gasoline and Horse Vehicles Being Obtained and Tabulated

The following are extracts from the first preliminary report:

In May, 1911, the Electrical Engineering Department of the Massachusetts Institute of Technology, Boston, Mass., was enabled through an appropriation put at its disposal by the Edison Electric Illuminating Company, of Boston, to undertake a special investigation of the transportation of merchandise in large cities, with special reference to the comparative performances and costs, of electric, gasoline and horse drawn trucks.

Although the information thus far obtained is not sufficiently extensive to warrant the drawing of definite conclusions, it is felt that an outline of the scope of the investigation and the work already accomplished, together with a brief discussion of the more prominent factors effecting costs, will be of moment to all those interested in motor trucking methods.

Classes of Service

The three types of vehicles now commercially available for such work are (1) the horse drawn truck, (2) the gasoline truck, (3) the electric battery truck. The investigation is being directed along two lines, namely the determination of the demands of the various kinds of service, and the study of the relative economy of the three types of wagons when used in any given service. It is pointed out that the amount of work which a truck can do depends upon the number of miles it can be driven in a day, and upon the time occupied in loading and unloading, the importance of this latter feature being often overlooked. To illustrate this point, a two horse wagon can do on an average not over fifteen miles per day without a relay of horses; an electric two-ton truck about thirty-five miles per day. Allowing an average speed for the horses of 3.5 miles per hour, and 6.5 miles per hour for the truck, the full mileage of the horse truck can be realized when it is in motion approximately 4 hours a day, while to get the full mileage of the electric truck it must be in motion 5.5 hours. On the basis of a nine hour working day, there is but little gain in reducing the standing time of a horse drawn truck to less than 55 per cent. of the total time, unless, of course, as before mentioned, extra horses are used, and this, of course, increases the expense. To get the full mileage of the electric, standing time should not be over 40 per cent. of the total time. If the horse drawn truck is replaced then by the electric under the same conditions, and no reduction made in the standing time, the electric could be utilized for only about twenty-six miles a day, and would be giving only 75 per cent. of its rated mileage.

The maximum number of miles per day that a truck is capable of running, assuming no interference from other traffic, is spoken of as its "Distance Capacity;" the ratio of the actual number of miles per day the truck is driven in any service, divided by the number of miles it is capable of running, is spoken of as the "Distance Factor." The greater the distance factor the less the cost for service. Data on loading and unloading conditions were collected with the object of determining ways of increasing this distance factor.

SUMMARY OF REPORTS FOR ELECTRIC TRUCKS

General:													
Rating	2,000 & 3,000 lb.	3,000 lb.	3,000 lb.	3,000 lb.	4,000 lb.	4,000 lb.	4,000 lb.	5,000 lb.	2,000 lb.	1,000 lb.	1,000 lb.	1,000 lb.	1,500 lb.
Company	No. 15	No. 15	No. 15	No. 9	No. 49b	No. 50	No. 9	No. 4	No. 15	No. 79	No. 9	No. 9	No. 9
Business	El. Lt.	El. Lt.	El. Lt.	El. Lt.	.....	El. Lt.	El. Lt.	Glue	El. Lt.	El. Lt.	El. Lt.	El. Lt.	El. Lt.
Service	.....	Meters	Lamps	Maint.	Miscel.	.....	Maint.	Hauling	Lamps	Lamps	Instal.	Instal.	Maint.
Period of data	30 mo.	20 mo.	26 mo.	5 mo.	17 mo.	14 mo.	6 mo.	5 mo.	16 mo.	12 mo.	19 mo.	7 mo.	4.6 mo.
No. of trucks averaged	18	1	1	1	1	1	1	1	1	1	1	1	1
Truck—Cost	$2,500	.....	....	$3,200	.....	.....	$4,630	$3,900	.....	.....	$2,441	$2,720	$3,000
Age	2-30 mo.	20 mo.	26 mo.	5 mo.	17 mo.	.....	6 mo.	5 mo.	16 mo.	34 mo.	19 mo.	7 mo.	5 mo.
Co's number	.....	18	15	94	.....	44	93	.....	37	2	67	89	95
Battery	Lead	Lead	Lead	Alkaline	Lead	Lead	Alkaline	Lead	Lead	Lead	Lead	Alkaline	Alkaline
Performance—Annual:													
Miles	9,420	9,727	9,988	6,052	7,080	7,171	7,328	6,292	7,525	3,980	7,680	6,720	9,078
Kilowatt-hours	4,704	3,786	3,704	5,388	.....	6,490	9,552	.....	4,754	1,704	3,164	3,963	5,890
Days used	296	297	281	300	.....	.....	284	238	280	293	288	252	300
Days out of commission	.....	15	37	.....	.....	.....	.....	.....	28	23	.....	.....	.....
Trips	.....	.....	.....	.....	.....	.....	.....	399	.....	.....	.....	.....	.....
Stops	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Weight of loads	.....	.....	.....	.....	.....	.....	.....	1,659,000 pound	.....	.....	.....	.....	.....
Expense—Annual:													
Operation—													
Running repairs	$229.68	$229.68	$229.68	$295.80		V	$196.62	.....	$229.68	$37.06	$181.80	$38.28	$141.48
Lubricants				19.44		V	16.64	$4.40		3.50	16.86	15.72	19.32
Electricity	176.16	151.44	148.16	.....	$583.68	$129.80	.....	112.83	190.16	85.20	.....	.....	.....
Garage	111.96	111.96	111.96	316.80		.....	271.24	120.00	111.96	307.50	301.56	281.16	296.80
Sundries	69.84	55.56	47.77	21.84		.....	14.94	31.70	76.44	.....	11.76	12.12	14.88
Driver	780.00	747.36	768.80	739.68	668.52	.....	963.24	704.00	0.00	728.00	637.20	703.68	825.24
Maintenance—													
Battery	153.36	157.36	55.58	61.32	199.56	411.97	93.52	.....	75.18	187.71	195.72	45.72	67.92
Tire	81.48	98.16	137.65	0.00	267.48	365.24	128.00	0.00	65.72	0.00	102.60	0.00	6.48
Overhaul		76.84	46.67		.....			93.47	223.82				
Painting	159.84	44.63	23.81	0.00	.....	365.75	80.00	.....	0.00	113.60	86.04	0.00	0.00
Fixed Charges—													
Amortization	192.48	230.00	230.00	540.00	.....	.....	780.00	975.00	192.48	264.00	408.00	456.00	504.00
Administration	62.52	62.52	62.52	85.92	.....	.....	73.58	.....	62.52	.....	64.92	82.08	85.92
Interest	125.04	150.00	150.00	.....	.....	.....	.....	234.00	125.04	110.00	.....	.....	.....
Insurance	12.50	15.00	15.00	.....	.....	.....	.....	152.00	12.50	182.56	.....	.....	.....
Taxes	69.48	77.50	77.50	.....	.....	.....	.....	.....	69.48	.....	.....	.....	.....
Co's total expense	$2,224.34	$2,208.01	$2,105.10	$2,080.80	$1,719.24	$1,272.76	$2,617.78	$2,427.40	$1,434.98	$2,019.13	$2,006.16	$1,634.76	$1,962.04

SUMMARY OF REPORTS FOR GASOLINE TRUCKS

General:										
Rating	6,000 lb.	6,000 lb.	8,000 lb.	10,000 lb.	10,000 lb.	500 lb.	2,000 lb.	2,000 lb.	2,000 lb.	3,000 lb.
Company	No. 4	No. 4	No 4	No. 82	No. 82	No. 8	No. 9	No. 9	No. 21	No. 85
Business	Packing	Soap	Packing	Trucking	Trucking	El. Lt.	El. Lt.	El. Lt.	N'sp'per	Miscel.
Service	Hauling	Hauling	Hauling	Hauling	Hauling	Service	Spare	Instal.	Delivery	Hauling
Period of data	8 mo.	12 mo.	9 mo.	5 mo.	5 mo.	15 mo.	25 mo.	32 mo.	6 mo.	13 mo.
No. of trucks averaged	1	1	1	1	2	4	1	1	1	1
Truck—Cost	$3,700	$3,624	$5,283	$5,760	$5,760	$950	$2,312	$1,934	....	$2,400
Age	8 mo.	12 mo.	9 mo.	5 mo.	5 mo.	9-15 mo.	25 mo.	32 mo.	6 mo.	13 mo.
Co's number				1	2	5 to 11	59	39	....	1
Performance—Annual:										
Miles	7,442	7,172	6,336	7,232	8,483	9,679	4,263	10,067	8,052	5,850
Gallons of gasoline	....	1,965	2,125	....	....	1,370	653	1,075	1,152	931
Days used	258	295	242	279	318	....	125	250	....	298
Days out of commission	....	....	....	37	18	....	....	....	....	....
Trips	665	966	1,229	1,446	1,697	....	....	....	....	2,480
Stops	....	....	....	....	....	....	....	....	....	....
Weight of loads	3,152,000 Pound	3,535,000 Pound	8,165,000 Pound	6,176 Tons	7,554 Tons	....	....	....	....	1,316,000 Pound
Expense—Annual:										
Operation—										
Running repairs	....	....	....	$ 744.96	$ 81.84	v	$ 404.64	$ 518.76	$ 4.08	$ 36.85
Lubricants	$ 60.10	$ 32.02	$ 58.59	324.00	372.00	$ 65.74	18.00	14.40	6.96	16.27
Gasoline	226.00	255.06	222.51	737.04	926.64	157.53	69.60	112.08	109.68	107.10
Garage	208.00	50.00	0.00	120.00	120.00	....	271.20	228.00	....	0.00
Sundries	14.45	7.53	192.52	....	....	....	15.12	19.32	....	....
Driver	1,036.00	1,100.00	959.52	1,296.00	1,296.00	....	247.08	705.36	....	1,009.12
Maintenance—										
Tire	584.00	111.05	0.00	1,740.00	2,064.00	267.96	19.92	151.56	....	150.00
Overhaul	442.00	17.60	56.30	....	....	} 591.78	} 45.24	} 190.32	....	} 62.13
Painting	....	....	....	....	....				....	
Fixed Charges—										
Amortization	925.00	906.00	1,320.00	1,152.00	1,152.00	....	768.00	648.00	....	600.00
Administration	....	....	....	....	....	....	60.84	50.16	....	....
Interest	222.00	217.00	317.00	345.60	345.60	....	....	....	....	120.00
Insurance	191.00	93.00	126.00	....	....	....	....	....	....	125.00
Taxes	....	....	....	....	....	....	....	....	....	....
Co's total expense	$3,908.55	$2,789.26	$3,252.44	$6,459.60	$6,358.08	$1,083.01	$1,919.64	$2,637.96	$ 120.72	$2,226.47

Cost Data

Cost data were collected in Boston, Chicago, Dayton, New York, Pittsfield, Rochester, St. Louis, Washington and other cities. The following is a table showing the forms on which this data were collected. Blank spaces indicate that the company did not make any report. This is usually equivalent to saying that they have kept no records of these items, and the number of blanks is very noticeable. The "check" mark, indicates that the item is included under some other heading.

In only two or three instances are the fixed charges completely given. The same is true of the operating costs. Maintenance costs are pretty well completed. A lack of accurate figures on the number of days the trucks were used and the number of days out of commission, trips, stops, weight of loads, etc., is very noticeable. Unless these items are all given it is not safe to use the figures as a basis for any computation.

The standard report forms gotten out by the Massachusetts Institute of Technology will be forwarded to any firm or persons having information which they are willing to give to the institute. The items on these forms first combine the points on which information is desired, and second, the headings under which the various costs can be conveniently grouped.

SUMMARY OF REPORTS FOR HORSE WAGONS

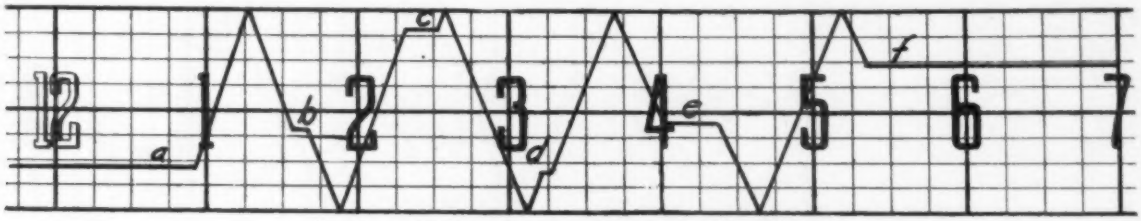
General:						
Rating	2 Horse	2 Horse	2 Horse	2 Horse	2 Horse	2 Horse
Company	No. 42	No. 41	No. 53	No. 34	No. 4	No. 82
Business	H'd'w'e	R'g'ters	Dpt.St're	Coffee	Packing	Bread
Service	Delivery	Hauling	Relay	Delivery 12 mo	Hauling 6 mo.	Delivery 12 mo.
Period of data	.....	.....	.....	.....	.....	.....
No. of units averaged	Rented	1	2	3	1	25
Ratio of horses to wagons	2	2	4	2	2	2½
Investment	.....	.....	$1,475	.....	$1,000	$600
Performance—Annual:						
Miles	....	4,000	4,700	....	5,526	....
Days each horse worked	.....	.....	.....	.....	286	....
Days each horse unable to work	....	....	....	....	....	....
Trips	....	900	....	....	603	....
Stops	....	....	....	....	....	....
Weight of loads	....	....	....	....	3,199,000 Pound	....
Expense—Annual:						
Operation—						
Shoeing	V	V	}	}	....	$ 64.00
Veterinary	V	....			....	V
Feed	V	$ 268.10	$576.00	$683.27	$ 480.00	390.00
Stable	V	276.50			120.00	199.00
Repairs	V	65.10	175.00		....	....
Sundries		....	....	....	34.00	....
Driver	V	700.00	1,456.00	729.47	888.00	400.00
Fixed Charges—						
Amortization	V	....	246.00	37.88	156.00	125.00
Administration	V	54.40	....	....	....	....
Interest	V	....	....	....	60.00	....
Insurance	V	....	....	8.32	39.00	....
Taxes	....	....	....	....	....	....
Co's total expense	$1,440.00	$1,364.10	$2,453.00	$1,458.94	$1,777.00	$1,178.00

Performance Records

Records of performance of horse drawn vehicles are comparatively scarce, and the comparison of the three types is somewhat difficult. The relative cost of performance of a given service by means of the three types depends largely upon the nature of the service, and particularly upon the loading and unloading conditions, also upon the limitations of speed due to traffic conditions in the cities. Of course, the more a high speed truck is limited by traffic conditions, the less its efficiency. The institute, in order to get accurate data, had installed on a number of wagons by the Boston Delivery Supervision Company, International Speed Registers, which instruments supply a tape showing the various move-

ments, stops, etc., of the truck, as shown in the accompanying illustration.

This cut shows a record for one afternoon of a two horse wagon. The heavy line which is traced by a pencil shows the movements. Where the line is horizontal indicates the wagon is standing, where inclined that the wagon is moving, the slope being proportionally to the speed. Horizontal distances are proportionately to the time. These tapes and the report giving a complete account of the vehicle's performance are mailed to the owner by the Supervision Company and received each morning. The institute is now receiving 45 tapes per day, and will soon be analyzing 70. In the following table is given the average performance of these vehicles for the first half of February, as taken from these tapes.



Specimen of Tape Showing Movement of the Wagon

It is anticipated that a careful study of such performance records will indicate where changes can be made in the method of handling the vehicles, whereby the amount of work done per day may be largely increased, with a corresponding decrease in the cost per mile, or per parcel.

Delays at Freight Terminals

One feature of the handling of freight, important alike to the teamster and common carrier, is that of the delays experienced at the freight houses due to the congestion of traffic. To get definite data on this point the institute has been given the privilege of taking observations on the vehicle visiting the inbound and outbound freight houses of the three railroads entering Boston; namely, the Boston & Albany, The Boston & Maine, and the New York, New Haven & Hartford.

These observations, which are being made by senior students at the institute, include the determination of the average time taken by the several types of vehicles at different periods throughout the day for the following five distinct movements: (1) entering, (2) backing, (3) loading and unloading, (4) exit, (5) delays. As the distances from the Boston wholesale district to any of the freight houses are comparatively short the length of delays will have an important bearing upon the work performed by any vehicle, whether horse or motor.

Physical Tests

A party of senior students is also conducting tests on the energy consumption of electric trucks when operated over the different kinds of pavements, with particular reference to the effect of non-skidding devices. Tests of battery and tire performance will also be made.

With the data at present available regarding cost and performance, it is impossible to draw up a reliable estimate of the cost of performance in any given service with any given type of vehicle. Service requirements are as important a factor in determining costs as the type of vehicles selected, and it is impossible to arrive at the cost of operating a vehicle, unless these requirements are known. Every class of service must be considered separately, and estimates that do not take this fact into account are practically worthless.

AVERAGE PERFORMANCE OF SIX TRUCKS

Deduced From Tape Records From February 1st to February 15, 1912

The letters indicating the service have the following signification:
A—City parcel delivery.
B—Miscellaneous hauling for electric light company.
C—Suburban baggage call and delivery.
D—Miscellaneous freight handling.
E—City pick-up for various companies.
F—Inbound and outbound freight for manufacturer.

Rating	1,000 lb.	4,000 lb.	3,000 lb.	6,000 lb.	1 Horse	2 Horse
Type	Electric	Electric	Gasoline	Gasoline	Wagon	Caravan
Company	51	9	5	30	77	77
Service	A	B	C	D	E	F
Miles run per day	30.1	14.7	45.7	13.9	18.5	13.0
Number of trips per day	2.0	4.11	3.6	2.3	6.6	3.9
Number of stops per day	25.1	8.7	34.6	13.7	23.6	11.2
Miles per trip	12.5	3.6	12.7	6.1	2.8	3.3
Office to first stop, miles	3.3	....	3.8	....	....	....
Last stop to office, miles	3.1	....	2.6	....	....	....
Hours in use per day	9.8	8.4	11.6	9.1	10.9	10.8
Hours running with load per day	2.9	....	....	....	....	1.1
Hours standing per day	6.6	6.0	7.6	6.9	6.8	7.1
Average hours loading per trip	0.57	....	....	....	....	0.66
Average hours unloading per trip	....	....	....	....	....	0.54
Number of pieces delivered per trip	14	....	8.4	....	....	....
Weight of initial load per trip, pound	....	1,330	....	....	....	....
Ton miles per day	....	7.4	....	....	....	....
Average running speed on long runs	9.6	6.5	14.8	7.6	5.2	3.6
Average running speed throughout day	9.3	6.2	11.5	6.8	4.6	3.5
Days used	13.0	13.0	14.0	11.0	13.0	13.0
Days out of commission	....	....	....	1.	....	....
Days ready, but not used	2.0	2.0	1.0	2.0	2.0	2.0

The International Harvester Commercial Car

This machine, as shown in the illustration, is in the service of "Folgers," Grand Rapids, Mich., and makes from thirty to sixty, and once in a while, as high as eighty miles in a day. After the purchase of the first machine, such satisfaction was given that soon another one was added to the equipment. The concern states that the cost of maintenance is much less than that of horse delivery, to say nothing of the better service gotten out of commercial vehicles.

INFORMATION BUREAU

WHAT WOULD YOU LIKE TO KNOW? FREE SERVICE

There are many important questions about commercial cars, or their use or care, upon which we feel sure our readers would like to be more fully advised.

Our Information Bureau will promptly reply to all such inquiries.

Write us stating fully what you want to know.

Address

Information Bureau,
COMMERCIAL CAR JOURNAL,
Market & 49th Sts., Philadelphia, Pa.

DEPARTMENT STORE DESIRES TO CHANGE METHODS

[218] Kindly give us your expert opinion of how to motorize our delivery system, whether you consider our needs will be filled by electric or gas machines. We are at present employing four wagons and six horses. We conduct a department store, and our packages are all light ones. Do not think a single one will be over 200 lbs. The territory to be covered consists of the city and surrounding suburbs. We think the distance the machine would have to cover would average about 35 miles a day. The roads are for the most part from fairly good to very bad, lots of cobble stones and many hills.

RICHMOND, VA. THALHIMER BROS.

Your proposition lends itself well to either gasoline or electric delivery wagon, but believe you will probably find a larger field for choice in the gasoline line. You will need a vehicle of about one thousand lbs. carrying capacity and with your street conditions a cushion or pneumatic tire will best answer the purpose. Two machines should be able to handle your work as outlined unless you from time to time hire extra rigs on the outside. If pneumatic tires are fitted a demountable type will probably save a considerable amount of time should change be necessary on the road. It will be wise to employ good, competent drivers, and, in making the change, a re-routing of deliveries will probably be found advisable, possibly using one machine for the city work proper and the other for suburban. There is hardly any question about the feasibility of the plan you have in mind and probably the only factors which might operate against its successful service would be incompetent drivers, high speeds and overloading; guard against these and you will have nothing but good to say of motor delivery.—Editor.

CUSHION TIRES WANTED

[220] We are in the market for a resilient solid rubber tire, 30 in. diameter by 3 in., capable of carrying 800 to 900 lbs. per wheel. We are using at present a dual solid 30 x 3 in., but want a tire with more resiliency. We cannot use a pneumatic, however.

GLENS FALLS, N. Y. MARSH-WALTERS CO.

The size mentioned by you is made to fit clincher rims. We are of the opinion that a side slip would cause them to tear off. The weight of 800 lbs. per wheel is too heavy to secure good results from a 30 x 3 in., even in a dual form, and if you will increase the size to 32 x 4 in. you can safely use a single tire and secure one having a different style of fastening to the rim, which will prevent side slip trouble. For more specific information regarding the kind of tire you need, we would advise you to write to the tire makers advertising in this issue.—Editor.

A CORRECTION: THE PIONEER BATTERY MAKER

In our July issue, page 54, in answer to inquiry number 216, the names of several storage battery manufacturers were given. By a gross oversight, the pioneer battery maker and one of the largest battery producers in the world, namely the Electric Storage Battery Company, of Philadelphia, was omitted. This company manufactures the well known "Exide" battery, and of course should have been included in our answer.—Editor.

COMMERCIAL CAR AGENCIES WANTED BY:

DANLEY & NASON, Manhattan, Mont. This town has a population of 600, and it is said requires cars of 1500, 4000 and 10,000 lbs. capacity, of the gasoline type, and to be medium priced.

J. L. PAUL, Gallitzin, Pa., agent for Great Western. This town has a population of 4500, and as stated, requires cars from 500 to 1000 lbs. capacity of gasoline type to sell for $500 to $1000.

PACIFIC MOTORS COMPANY, distributors, 682 & 84 Washington Street, Portland, Ore. This city has a population of 675,000 and the company states it requires cars of 1 and 1 1-2 tons capacity of the gasoline type to sell for $1800.

A. A. HIBBARD, Thomas Building, Reno, Nev. The towns of Reno and Sparks have a population of 15,000, and it is stated require light capacity cars of the gasoline type to sell for $500 to $1000.

E. R. BOSTON, Cedarville, Cal. This town has a population of 500, and requires trucks from 1200 to 4000 lbs. capacities, to sell at $1000 to $2000.

HILL CITY GARAGE, Forest City, Ia. This city has a population of 2000, and requires cars of one-half, one and two-ton capacities, selling at $1500 or less, of the gasoline type.

WEDGE GARAGE COMPANY, of Zanesville, O. This city has a population of 28,000, and the company states could use cars of 1500 to 4000 lbs. capacity, of the gasoline type, to sell at $600 to $2000.

AGENTS WANTED

VEERAC SALES COMPANY, 218 Patterson Street, Paterson, N. J. Car has capacity of 1500 lbs.; sells for $825, chassis only, bodies to suit.

NEWS of the DEALERS and GARAGES

BRYON CHASE, Pittsfield, Conn., has taken agency for Velie cars and trucks.

HILLER BROS., Marion, Conn., have taken agency for Velie cars and trucks.

DR. J. M. WILLIS, Williston, Fla., is erecting a commercial vehicle garage.

H. Y. YEAGER, Hartford, Conn., has taken agency for Velie cars and trucks.

G. W. HAAS, of Mansfield, will handle the full line of General Motors trucks.

T. G. NORTHWALL & COMPANY, Omaha, Neb., has secured the agency for Poss trucks.

PARK MOTOR MANUFACTURING COMPANY, Cleveland, O., has taken agency for Poss trucks.

SKUBAL & SCHAUER, of Milwaukee, Wis., have secured agency for General Motors trucks.

ROSCOE BENJAMIN, Winsted, Conn., has taken on the agency for Adams trucks, for Litchfield County.

MINNEAPOLIS AUTO TRADING COMPANY, Minneapolis, Minn., has secured the agency for Commerce trucks.

AMERICAN MARION SALES COMPANY, New York, N. Y., has secured eastern sales agency for Stegeman motor trucks.

COCRANE MOTOR SALES COMPANY, St. Louis, Mo., is now selling Garford trucks in connection with Gramm trucks.

KEYSTONE KOMMERCIAL KAR COMPANY, Philadelphia, Pa., has taken the agency for the Detroit Motor Wagon Company.

MAGNA AUTO COMPANY, Division and Railroad Streets, Holyoke, Mass., has taken on the agency for Adams trucks at that point.

ANDREW MURPHY & SON, Omaha, Neb., dealers in Kelly trucks and Detroit electrics, have started work on a new garage next to their present building at 15th and Jackson Streets.

CHAS. E. REISS & COMPANY, 1776 Broadway, New York City, has been appointed agent for the states of New York, Pennsylvania, Maryland and Virginia, for the Stegeman Motor Car Company.

ELECTRIC GARAGE COMPANY, Omaha, Neb., has been succeeded in the sale of Packard motor cars by the Orr Motor Sales Company, although both of the companies are occupying the same building at 40th & Farnam Streets.

BALDWIN-SMITH MOTOR TRUCK COMPANY, 115 E. 2nd Street, Wichita, Kan., has been organized for the purpose of handling commercial motor trucks in Wichita and vicinity. It has closed a contract with the Lincoln Motor Car Works, of Chicago, whereby it becomes distributing agent for the Lincoln light delivery wagons.

FILLOW AUTO COMPANY, Danbury, Conn., has purchased two lots immediately east of its garage, on Crosby Street, and the land will be leveled and used for day storage temporarily. Later on a new structure, devoted to the motor truck business, will be erected on the property and joined to the company's present structure.

SPARE THE COOLER

It is the practice of some makers of commercial cars to equip them with a bumper bar extending from one frame rail to the other in front of the cooler, in order to spare the cooler damaging jolts and jars which would otherwise be imposed when working at close quarters, as at freight stations or in crowded, narrow streets and alleys. One user of a five-ton car had ideas of his own as regards a bumper or front shock absorber, especially after horse teams backed into the cooler a few times, necessitating repairs that proved expensive. He suggested to the makers that a bumper, suited to his service conditions be built for him, but the truck people could not see things in his light, contending that such a buffer as he desired was contrary to their ideas of flexible frame construction. The user then had such a device built elsewhere, and states that it is working very satisfactorily.

That there is imperative need of a buffer is evident from observation of cars at work in crowded sections. A simple cross bar serves very well, and in event of a severe shock will, as provided in most cases, give or spring before any serious damage can be done to the car frame.

PARSONS WAGON COMPANY, Marathon, N. Y., has closed a deal whereby they are to build bodies for Pierce-Arrow five-ton trucks.

THE CITY OF NEW YORK has purchased three Garford cars for police patrols. Motz High Efficiency Cushion Tires were specified.

United States Tire Company has moved its general offices to the new United States Rubber Building, Broadway and 58th Street, New York City. The basement and sub-basement will be occupied as a stock room, the ground floor for its New York branch, and the fifteenth, sixteenth and seventeeth floors as general offices.

Kelly Motor Truck Company's Western Branch

The above illustration shows the new San Francisco branch of the Kelly Motor Truck Company, at the corner of Fourth and Harrison streets. The garage is said to be the largest motor truck garage west of Chicago, and has a capacity of eighty trucks. Another addition is being contemplated which will accommodate ninety trucks. This branch, which is in charge of Chas. B. Shanks, embraces nine coast and western states, and the Hawaiian Islands. F. G. Miner, well known on the Pacific Coast, has joined the concern and has been appointed sales manager for San Francisco and the Bay cities.

Taking On a Commercial Car Agency

BY E. S. FOLJAMBE

This is the first of a series of eight articles by Mr. E. S. Foljambe, dealing with subjects of interest to agents, dealers and manufacturers. Briefly, the subjects taken up are: Taking On a Commercial Car Agency; The Kind and Location of Salesroom; The Selection of and Instructions to Salesmen; Obtaining Prospects; Carrying the Campaign Into the Prospect's Territory; How the Engineering Force Can Assist the Retail Sales Department; The Agent's Responsibility After the Sale, and Relations Between the Agent and the Manufacturer. We are sure these will prove instructive and interesting reading.—EDITOR.

IN THE brief space of five years the selling of motor driven delivery vehicles has grown to be a recognized business, having its economic place and value. Instead of the few converted stables, side rooms of pleasure car agencies, bicycle and motorcycle shops, which were so common as commercial car agencies a few years ago, we now have the well appointed and up-to-date establishment, combining offices, show rooms and service department.

The early agent could not depend for a living entirely on the sale of commercial cars but must eke out his meagre existence by selling pleasure cars, motorcycles, bicycles or by doing repair work.

Already these conditions are being changed, and the opening for live men as commercial car agents is undoubtedly one of the best in the automobile business to-day; but do not jump to the conclusion that it is "easy-money" or a "get-rich-quick" proposition, for it is nothing of the kind, but a legitimate business and one requiring much training and considerable capital. However, the well known advantages of growing up and developing with an industry are present and need not be dwelt upon. That the sale of commercial cars is a growing industry, and a rapidly growing one, cannot be denied, and this growth will unquestionably continue for many years to come.

Large Capital Required in Large Cities

In very large cities, say over 300,000, good business judgment indicates that the agency better be under the control of a firm or company, rather than an individual. Futhermore, such a company should not consider an agency unless intending to continue permanently in that line. Business men prefer to deal, especially when buying in large quantities, of an established concern, and not of an individual who may or may not be in business at the end of the year. Mr. Smith buys a truck this year of Mr. Jones the agent, but at the expiration of Mr. Jones' yearly contract he is no longer agent, and Mr. Bond takes his place. He has no particular interest, or is not nearly as much concerned over the performance of Mr. Smith's truck as Jones was. The usual result is that Mr. Smith is not taken care of as he thinks he should be, and he becomes dissatisfied; others hear of it, and in cases where the agent has been changed two or three times in succession, it is usually found that it is a very difficult matter to sell a truck at all. The purchaser is very much more apt to deal with a branch, as he knows that he will be taken care of just the same from year to year, regardless of who happens to be in charge. For this reason, many of the well known manufacturers are discontinuing their agencies, and establishing branch houses in the large cities.

Cost of Doing Business

Furthermore, the demands on the individual agent in a large city, as to demonstrations, advertising, etc., are so great that the agent often finds that he has spent eight or ten thousand dollars the first year without returns. Occasionally much more than this is spent, and in most cases it is found that the cost of doing business is so high that the individual agent, unless already well to do, cannot handle it. The cost of selling is estimated by various dealers at in the neighborhood of five per cent., and a matter of surprise to many is the cost of maintaining the trucks after they have been sold, this being placed at anywhere from eight to ten per cent. This figure may seem rather high, but is confirmed by the experiences of several well known agents in large cities, thus the individual agent who is presumably receiving twenty per cent. is left with but five per cent. for his profits. But it must be remembered that these figures are true only with regard to first sales; with reorders they are very much less and decrease as the size of reorders increase.

Another feature in the large city which makes it difficult for the individual, is the enormous amount of missionary work which must be done in the new field before sales commence, and more than one agent has found the twelve months to have passed without selling a single truck, or perhaps with only two or three on his books. There is also a great temptation the first year to share the profits with the prospective purchaser, and therefore cut down one's own income in the attempt to get cars in service, always with the distant sireen "reorders" ever before to lead one into further indiscretions. Some agents do this regularly for even greater periods than the first year in order to establish their goods. As a rule, this missionary work forms the basis of returns the following year, but the capital required for all these demonstrations, advertising, visiting prospects, organizing, and building up an efficient office force, requires more capital than the ordinary individual is blessed with. So I say that in the large cities it is a questionable business proceeding to take the agency single-handed; better form a company, or endeavor to have the manufacturer arrange for a branch. The reward to the hard working agent, however, if he succeeds under such conditions is often that of becoming manager of the branch which the house may establish, but unfortunately this usually takes place after he has spent most of his money.

The Mechanic's Attitude

It is not advisable to attempt to sell both pleasure cars and trucks in a large city unless on such a large scale that entirely separate sets of mechanics can be utilized. It is peculiar, perhaps, but nevertheless true, that mechanics that have operated and worked on pleasure cars do not relish repair work on trucks, their antipathy is so marked that it might almost be termed "the mechanic's attitude." In establishments where both pleasure cars and trucks are sold, it has been noted that the trucks are slighted, and the men are anxious to get off the job and at work on a pleasure car. For this reason alone, if for no other, it is not wise to attempt to operate both together. To obtain satisfactory results, mechanics brought up, as it were, on trucks should be employed for truck work.

Novel Co-operative Scheme

A unique co-operative system is now being organized in one of the large cities for the purpose of securing the co-operation and interest of the user. The system consists of making every purchaser a stockholder in the agency or branch, one hundred shares of stock being sold to the purchaser at a moderate figure. As a stockholder he is admitted to the regular meetings, and all the books, accounts, etc., are open to his inspection, so that he can see exactly what the company is making. Being a stockholder also gives him a personal interest in having the company succeed. If through his efforts a sale is made, five per cent. is laid away, two and one-half going on the books of the company, and two and one-half being credited to his account on overhauling, repairs, garaging his trucks, etc. If the owner does not care to become a share-holder to the extent of $100 or more, he will, of course, have to pay the regular rates for any garaging or repairs. By this means it is hoped that all the users will become better acquainted, and that they will become boosters for the particular truck which they are using, and that they will have sufficient interest to help make sales. The working out of this system will be watched with interest by many a branch house.

Choosing the Car

Let us assume that a decision has been made to enter the field of commercial car selling, the choice of machine, location and kind of salesroom must then at once be settled. We will first consider the factors determining the choice of the car. This is effected very largely by the character and size of the city or territory to be represented. The needs of the user must be well understood as nothing but failure can follow the selection of a machine too high priced or otherwise unsuited to the territory. In small towns where there is no great amount of heavy hauling, manufacturing or building, the choice would naturally be among the medium priced, lighter weight delivery wagons.

If the territory is a large one including many large manufacturing establishments, department stores, wholesale houses and the like, the choice should include both large and small capacity vehicles to suit all the varied requirements. Having settled upon the capacity of the cars the make must then be decided.

The reputation of not only the car but the manufacturer should be considered. Cars which have already made good are naturally to be chosen in preference to new cars no matter how well built and designed they appear to be. There is no use entering with one's eyes open into an up-hill fight; choose the type of machine which is sought for by the public, rather than ride a hobby and endeavor to educate the user to your views. Study the likes and dislikes of the public rather than cater to your own fancies.

A feature which is often overlooked by the new agent is the value to him of the advertising already done by the manufacturer. A car the name of which is already well and favorably known to the public through advertising, is a better proposition than a car which has not been extensively advertised. Every dollar's worth of advertising of the manufacturer becomes an asset to the agent.

Ability to Get Parts

Ability to get deliveries and parts is another factor which should be given serious thought when selecting the car, for the success or failure of the agent is in large part dependent upon the success or failure of the manufacturer. A large and successful trade cannot be established if shipments are slow and parts are not forthcoming when needed. The cost of parts and replacements is another important factor, as more than one agent has found to his regret when representing a manufacturer whose chief aim seemed to be to make as much money as possible out of the extra parts required. An agent cannot be too careful with which manufacturer he associates himself, so much of his success depends upon the factory behind him. The ordering of duplicate parts is a thing in which there must be no mistakes or delays, these being fatal to the agent's business. It seems to be almost universally true that even the pleasure car user is in anything but an amiable frame of mind during the entire time that he is waiting for parts, and his car is out of commission, while the commercial car user whose business is absolutely dependent upon his trucks is even more disgusted. Delays under these circumstances are extremely harmful to the business. To facilitate ordering, some manufacturers have catalogued every individual unit which enters into the construction of a truck; each and every part is shown clearly in a photograph and numbered. Each assembly is also shown and numbered, and has a code word. By this method it is possible to quickly and accurately order any individual part going to make up a truck, and mistakes and consequent delays are therefore avoided. Such catalogues, however, are only gotten out by well systemized factories, and other things being equal, these are the kind of makers to represent.

If the commercial car agent was previously connected with the selling end of the industry representing pleasure cars, or perhaps still representing a pleasure car maker, the choice of a truck should be influenced by his pleasure car clientele. Many of these are live prospects for commercial cars and properly handled should form a valuable list for the new agent.

The character of the country occasionally plays an important part. If very hilly with sandy roads comparatively slow speed motors with low gearing are to be preferred.

Other things being equal simplicity of design is important as low cost of upkeep can be maintained if there are not too many adjustments and parts which can be tampered with by the inexpensive operator.

Favorable contracts with the manufacturer are, of course, a consideration, and occasionally concessions may be had which will make the choice of one truck over another a matter of business policy.

(To be continued.)

Success! **A good commercial car and a good driver**

The Wolverine-Detroit Eight Hundred Pound Delivery Car

ONE of the more recent of the Detroit commercial innovations is the Wolverine-Detroit single-cylinder friction-shaft-driven commercial car made by Pratt, Carter, Sigsbee & Company, of Detroit, Mich. This little car is designed to transport a load of eight hundred pounds. The price, with body as shown, is eight hundred dollars; with panel body, it is eight hundred and fifty dollars.

Final drive through a shaft is somewhat unusual in cars employing the friction transmission, but very good results are claimed in this instance.

Single-Cylinder Motor

As a matter of simplicity, the single-cylinder engine is favored, rated at 12 h.p.; water jackets integral and valves enclosed. Stroke is 5½ in., bore 4½ in.

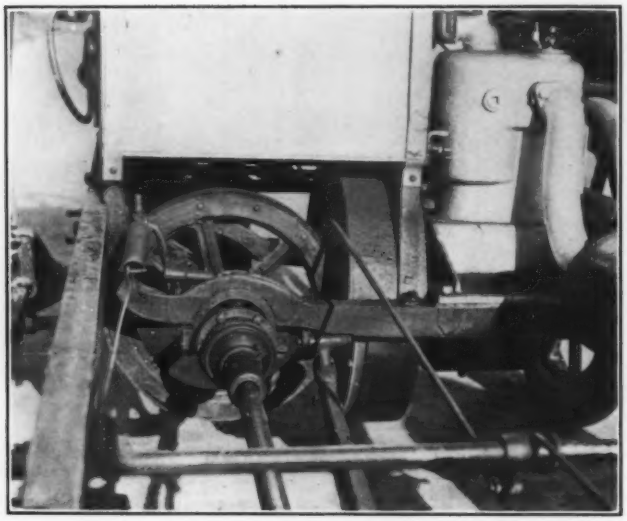
The cylinder is of the L-type, the valves placed side by side; spark plug over the inlet; compression release cock over the exhaust. The cylinder and the upper section of the crank case are cast in one piece, support to the malleable cradle subframe being through two broad stout lugs, anchorage through six ½ in. steel bolts, the crank shaft retained in the upper section of the case in the usual manner. The bottom section of the crank case forms the oil pan. The valves are placed in overhanging pockets and are 2¼ in. in diameter. The cylinder is so cast that a housing is formed for the valves, closed in with a cover plate.

The motor is set crosswise, instead of having the line of drive from front to rear, as is usually the case. This, of course, alters the usual position of the friction assembly, but in the main the results are much the same, save that the final effort is imparted through a double universal-jointed propeller shaft instead of side chains.

The crank shaft is 2 in. in diameter on the flywheel end, 1½ in. on the forward end, pin bearing being 2 in. The babbitt lined bearings are adjustable through shims.

Wolverine-Detroit Eight Hundred Pound Delivery Car

The machine illustrated lists at $800 and with a panel body at $850. It is powered by a single-cylinder, 12 h.p. motor, set crosswise under the seat and in direct line with the friction-drive transmission. The final drive is through a double-universal-jointed shaft to an offset differential on the rear axle.



The Wolverine-Detroit Transmission and Motor

Showing the manner of placing the motor and transmission. One of the members of the transmission also acts as a flywheel. The sliding wheel is lined with tarred fiber, bearing upon an aluminum disc.

The connecting rod is of the usual order, drop-forged steel, the wrist pin, however, being retained in the rod by means of a pinch bolt, which disposition gives a little larger bearing surface on the piston bosses. The pin is a "drilled-out" member, hardened and ground and specially treated, and is 1¼ in. outside diameter, bored out to ¾ in. inside diameter.

Friction Transmission

One feature of the construction that readily attracts notice is the friction assembly, which is the reverse of the usual practice. This, as explained above, is due to the fact that the shaft form of final drive is desired, which necessitates placing the engine crosswise of the main frame.

The friction disc, of aluminum, is 18 in. in diameter, though but about 16 in. of this is actually utilized in the travel of the sliding wheel. The friction wheel is cast iron and operates on a splined cross shaft or jack shaft, 1¾ in. in diameter. The wheel is 16 in. in diameter, 1½ in. face, friction surface a tarred fiber, which is retained through a ring and bolts, easily removed when necessary and inexpensive of replacement. The spline, which is seated in a keyway on the transmission shaft, is 7-16 in. wide and is 3-16 in. outside the shaft, the wheel being keywayed to accommodate the spline. The friction wheel is caused to travel across the face of the friction disc by the usual hand lever, inside the body and close to the driver, being mounted on a quadrant. The outboard bearings for the cross shaft are New Departure, annular type. An extra large bearing is fitted at the rear of the shaft to care for the end thrust. The wheel is shifted through a fork connected to a ⅝ in. rod.

The propeller shaft is 1¼ in. in diameter, squared at each end, forward having an upset square 1¼ in.; rear end is 1 in. square. Two universal joints are fitted.

Offset Rear Axle

The rear axle assembly is interesting. The main housing is offset from the center 9 in. One-half on the main round differential housing and the left-hand tube or axle casing and the brake spider are formed integral. The right-hand tube and brake spider are formed together in like manner. The tubes are machined down to accommodate the axle seats, thus affording a positive anchorage for the seats, the springs, of course, being permitted to oscillate on the tubes; lubrication is through grease cups.

The differential is of the bevel-gear type, there being four pinions of ¾ in. face. The master bevel is 1¼ in. face pinion, which is secured to the pinion shaft operating on two bearings which are carried in a sleeve, is same face. Adjustments can be made without disturbing the bearings; likewise the gear mesh can be varied.

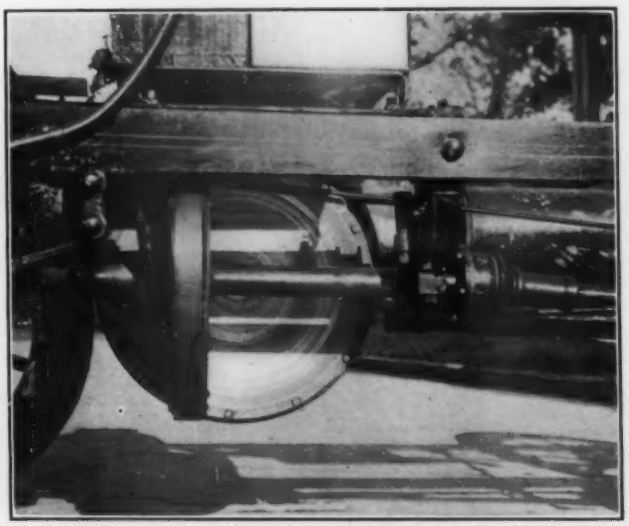
The rear axle gears are all 5 in. pitch. The driving shaft is 1 5-16 in. diameter, 1½ in. on the bearing, and is made of nickel steel. Dust collars are fitted at each end of the shaft. Bearings in the rear axle are Timken roller. The position of the friction-wheel shaft with elements is shown in one of the accompanying illustrations, also the rear axle housing, the main body of which is placed towards the left from center. The housing is trussed by a steel bar, provided with the usual adjustment. A crucible-steel torque rod, triangular and channel section, is used, anchored to the rear axle housing and extending forward and terminating in a ball joint on the engine cradle or subframe.

Frame

A standard 3 in. channel-steel frame is used, reinforced by cross braces. The spring horns are made of cast steel and are hot-riveted to the frame sides at either end. The motor and the friction assembly are supported on a malleable subframe, which also braces the main body. By loosening 4⅞ in. steel bolts, this malleable-iron subframe or cradle, with the engine and transmission, may be lifted from place. The motor is carried on the right-hand side of the subframe, the transmission on the left.

Springs

Front and rear springs of the Wolverine-Detroit 800 lbs. delivery car are semi-elliptic, 40 x 1¾ in., six leaves front and seven leaves rear. At the forward ends the front springs are secured to the frame spring horns, rear to shackles, the brackets of which are riveted to the bottom flanges of the frame rails. The rear members forward are secured in like



Another View of the Wolverine-Detroit Transmission

A side view, showing the location of the friction drive, which is directly under the gasoline tank. Note the splined shaft bearing and universal joint on shaft to rear axle.

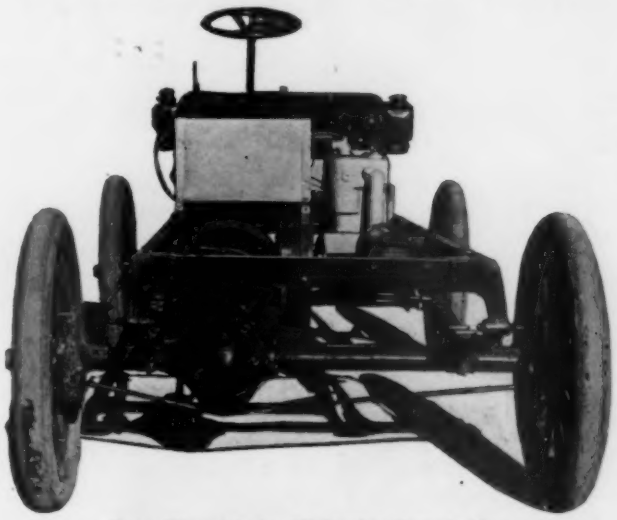
manner, while at the rear, retention is to the spring horns, riveted to the frame. Nickel-steel spring bolts are used, drilled and channeled for admittance of grease for lubricating. These bolts are all ground to size. The rear spring front brackets also support the brake rocker shaft.

Wheels

Wheels are artillery type, wood, ten spokes forward, twelve spokes rear. Wheel base is 89 in., tread 56 in. Tires are 32 x 3½ in. Q. D. pneumatic, or 32 x 2½ in. solid. Front and rear wheel spokes are 1¼ in. Clearance is 10 in.

Brakes

There is, strictly speaking, but one set of brakes in the Wolverine-Detroit, that in the rear wheels, fully enclosed, 12 x 2½ in., worked through the foot pedal, internal expanding type. The friction reverse may be used for braking; quite an effective brake when properly applied. The pedal effort is transmitted through 5-16 in. adjustable pull rods and drop-forged levers, rocker shaft being ¾ in. diameter.



Rear View of the Wolverine-Detroit Car

Attention is called to the offset differential, which is occasioned by the position of the transmission. This view gives a very comprehensive idea of the simplicity of design in this car.

I-Beam Front Axle

An I-beam front axle is used, having integral steering yokes and spring seats. The member is of conventional design and is dropped at the center, fitted with large Timken Roller Bearings.

Cooling

The engine is water-cooled, and, as before stated, the jacket is formed with the cylinder,—due provision for keeping the valves cool. The radiator is a flat-tube type, rather neat in appearance, secured to the 5-ply laminated wood dash through four bolts; so that, in a sense, it is relieved of frame shocks. The dash is strong in construction and is straight. Thermo-syphon system is employed, the outlet from the engine cylinder to the radiator passing along the left side of the car near the top of the side panel. Outlet is 1½ in. hose; intake 1¼ in. hose.

Lubrication

Lubrication is by splash from a sightfeed oiler. By this method the connecting rod and the main bearings are amply cared for, and though the case may be filled, it is claimed by the makers that the much mooted smoky exhaust has been overcome; this by means of the pistons, which are drilled to receive the excess oil which finds its way back to the crank case.

Ignition

Ignition is by jump-spark system, from multiple dry cells and coil, which are carried out of the way and within the car. The spark plug is placed over the inlet valve.

Carburetor

An automatic float-feed carburetor is used, secured in the usual fashion. The fuel tank is carried under the seat, with feed by gravity. Control is from the steering wheel. The muffler is located amidships and carried on the right side.

Steering

A worm and full gear steering system is employed, this fitted with eccentric bushings to take up the wear. The steering post is inclined and is 1½ in. in diameter, wheel 16 in. The steering rods are back of the axle, drag link fitted with the usual ball and socket joint and spring buffer, both cross rod and drag link being ¾ in. in diameter.

Control

There is nothing out of the ordinary in the control of the Wolverine-Detroit. Steering is from the left-hand side and the friction wheel is forced to travel along the face of the friction disc by means of the hand side lever, mounted in a quadrant anchored to the floor boards. The friction shaft is carried in two eccentrics, which allow motion against the wheel, the wheel and disc being brought into final engagement through a foot pedal. The clutch pedal and the brake member, are lockable, and are not interconnected, as is usually the case with friction outfits, but are separate and independent. Spark and throttle are controlled from the steering wheel quadrant in the usual way. As before mentioned, there is but the one set of brakes in the rear wheels, but the friction reverse may be utilized as a brake if so desired; in fact, this is the common practice with users of this type of car.

Bodies

In the illustrations herewith the Wolverine-Detroit is shown with flare board open express body, but the chassis may be had with panel type, if so desired by the purchaser. Body prices are mentioned at the beginning of this sketch.

Equipment includes side oil lights, tail lamp, jack, horn, tools, tire repair kit, and the like.

FEDERAL FIRE FIGHTER

The Federal Motor Truck Company, of Detroit, Mich., has just produced a Combination Chemical and Hose Truck. This car is made up of a regular model "D" chassis fitted with a body equipped with the latest and most up-to-date fire apparatus obtainable. The car is fitted with side seats and brass "grab" rails; 1000 ft. of regulation hose; two 25 ft. extension ladders; a 35 gal. Badger chemical tank; two 5 gal. hand extinguishers, etc.

The average speed of this outfit, which can also carry eight men beside the two operators, is 22 miles per hour, about twice as fast as a team-drawn wagon. The equipment is complete and everything is arranged that operators may have the quickest action possible. Tires are the Swinehart Cellular.

Atterbury Commercial Cars Made in Four Sizes

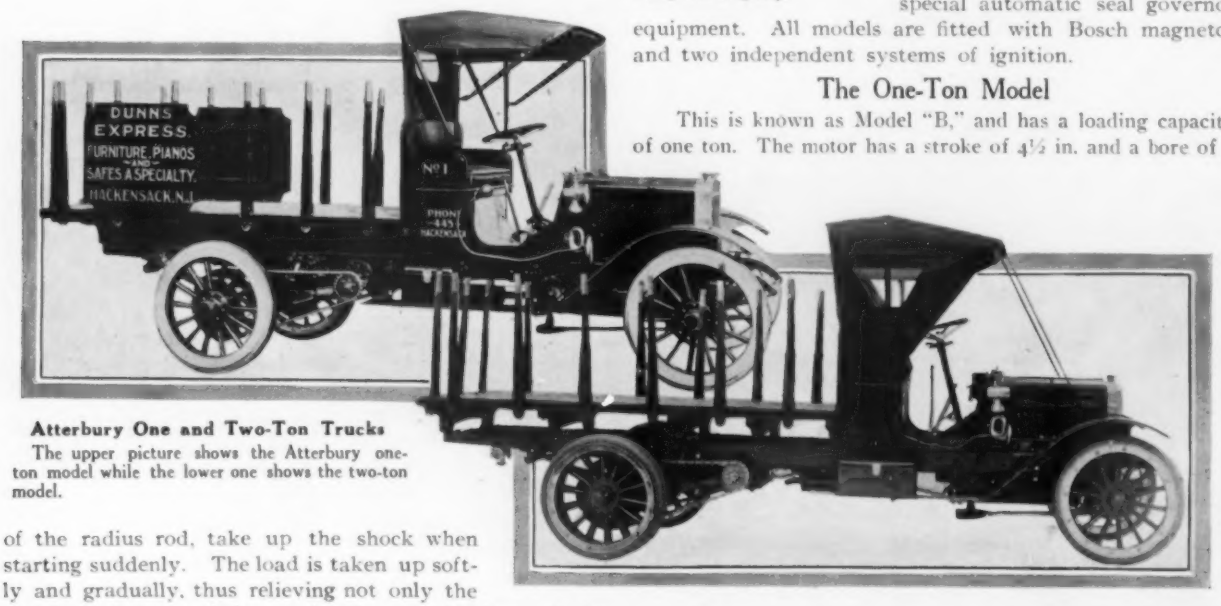
FOR the season of 1913 the Atterbury Motor Car Company, of Buffalo, N. Y., is featuring four types of commercial cars, consisting of a 1200 lb. delivery car and one, two and three-ton trucks. All models employ four-cylinder motors, three speeds selective transmission, multiple disc clutch, and side chain drive from jack shaft.

One of the main features of the 1913 model lies in the construction of the radius or strut rod. This is made on swivel on the rear axle, with a double universal action between the axle and jackshaft, so as to absolutely relieve the machine of any undue strain to the axle or jackshaft when the wheels get into a depression. The heavy buffer springs which are used in this construction, attached to the front end of the radius rod, take up the shock when starting suddenly. The load is taken up softly and gradually, thus relieving not only the clutch and transmission and other mechanism of the sudden jars, but also relieving the tires and prolonging the life of the whole machine. This feature can be fully appreciated when a driver backs his loaded truck into a curbstone, absorbing all the shock of the compact.

Atterbury Radius Rod Construction

This radius rod swivels on the rear axle and has a double universal action between the axle and jack shaft. Note the heavy buffer springs.

Another feature is the use of special automatic seal governor equipment. All models are fitted with Bosch magnetos and two independent systems of ignition.

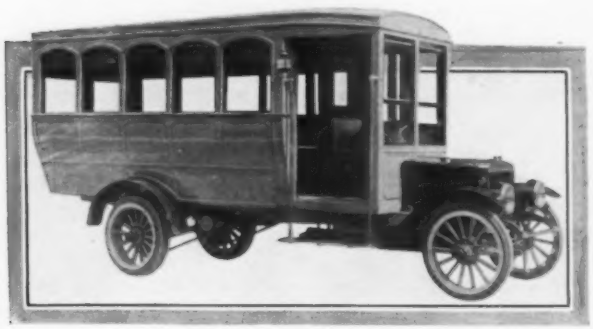


Atterbury One and Two-Ton Trucks

The upper picture shows the Atterbury one-ton model while the lower one shows the two-ton model.

The One-Ton Model

This is known as Model "B," and has a loading capacity of one ton. The motor has a stroke of 4½ in. and a bore of 4 in. The frame is of pressed steel. Length over all 188 in. The radiator is of special vertical type fitted with a very heavy water jacket, and is mounted on springs to relieve all undue strain or vibration. The front axle is a heavy drop forging, fitted with roller bearings. The rear axle is 2½ in. in diameter, solid, round. Springs are of semi-elliptic type, 40 by 2½ in. in front and 50 by 2½ in. in rear. The steering gear is of the worm and nut type. The wheel is 18 in. in diameter, mounted on an aluminum spider. A single throttle connection is placed under the wheel on the left side. The brakes are of double internal expanding type. The drum is attached to the rear wheels, thus relieving the jackshaft transmission and chain of all braking strain. The tires are 36 by 3½ in. front and 36 by 4 rear, solid. This model, as well as any of the other Atterbury models, can be fitted with any kind of body desired.



Atterbury Station 'Bus

A sample of a special job made by the Atterbury Company. The picture shows a twenty-four passenger hotel 'bus of the pay-as-you-enter type.

The Two-Ton Model

The Atterbury Model "C" two-ton truck uses a slightly larger motor, having a bore of 4⅛ in. and a stroke of 5½ in. The frame is 215 in. long over all, and 36 in. wide; wheel

Atterbury Three-Ton Truck, Model D

Platform stake body mounted on an Atterbury three-ton chassis. The body has a loading space of 12 x 6 x 6 ft. This model has a wheel base of 12 ft. 9 in., and a tread of 5½ ft.

base is 143 in. The rear spring is 2¼ in. in diameter, and a 20 in. steering wheel is used. The tires are 36 x 3½ in. and 36 x 3½ in. dual rear. All other specifications are the same as for the one-ton model.

Three-Ton Model

In this model a 4⅞ x 5½ in. motor is used. The frame is of channel steel, 7 in. deep by 2½ in. wide. Its length over all is 226 in., while its extreme width is 38 in. The rear axle is 3½ in. solid, round. The front springs are 40 x 3 in., and the rear springs 54 x 3 in. The steering wheel is 22 in. in diameter. The tires are 32 x 4 in. in front, and 36 x 4 dual rear. Otherwise the specifications are practically the same as for the two-ton model.

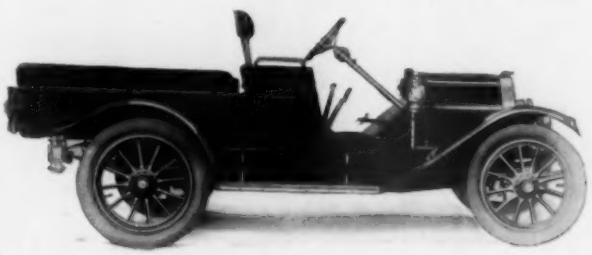
Bodies

These trucks are equipped with bodies of regularity of length and width, so that the prospective purchaser has a splendid variety of bodies to select from. They will fit on any of the Atterbury standard chassis. This company is also prepared to build special bodies to fit any requirements. One of the illustrations herewith shows a special body made by this company which is known as a 24-passenger pay-as-you-enter 'bus. This body is carefully designed and finished, having a drop sash which can be raised in stormy weather or when necessary.

A Detroit Department Store is using the motor truck as a moving bulletin of special sales. Panels two feet deep and the full length of the truck are attached on both sides, and signs large enough to be read, while the truck is running, show the goods for sale. The store figures that the advertisement pays them for the cost of maintenance of the truck.

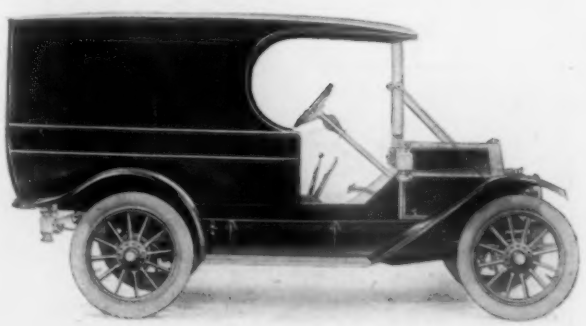
TWO NEW OVERLAND DELIVERY CARS

Made by the Willys-Overland Company, of Toledo, Ohio.



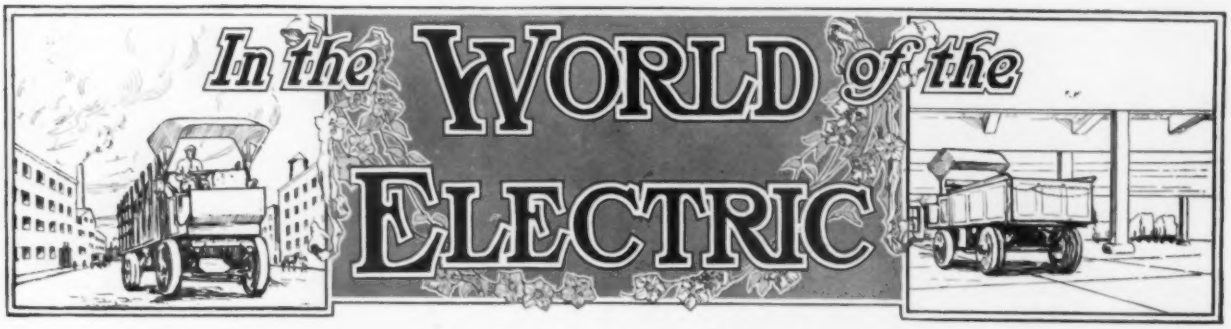
Overland 800 lb. Car with Express Body

View of Model 59, 800 lbs. Capacity, Delivery Express, mounted on same type chassis as "Special"; with 67 in. length of floor, 42 in. width of floor, 10 in. height of side, and 6 in. width of side wings; wheel base is 106 in.; tread 56 in.; tires 33 x 4 in.; finished in Overland blue, with gold trimmings, at $950.



Overland 800 lb. Closed Body Car

View of Model 59, 800 lbs. Capacity Delivery "Special," showing closed body mounted on the same type of chassis as is used by Overland pleasure cars, with dimensions of 60 in. long, 43 in. wide, and 53 in. high from floor to top of car. Attention is called to the peculiar three-quarter elliptic rear springs, and strongly braced windshield. Handsomely finished in maroon, with black trimmings, at $1000.



BUYING BATTERY SERVICE

A prominent owner of electric commercial cars, who has come to this type after trying out all others, states that his service would be materially bettered and simplified if he could purchase battery service, just as he can now buy tires at so much per mile. This would doubtless be a very convenient arrangement for the user.

He contends that such a system would enable him to get better service out of his fleet of electrics which he must keep constantly on the move to operate to the best advantage. The cars are never idle during the working day. He has an arrangement with a tire concern whereby he can purchase his tire service on a mileage basis, a practice that is in vogue in many cities, especially for taxicabs and public service cars.

Consideration of this scheme would indicate that the user would be put to much less fuss. As he states it himself, "The battery is one of the most costly features of electric car operation."

"In view of the fact that there are many electric cars in this city, it would appear that some reliable party could do a good business by selling 'battery service' at so much per car per year or, on a mileage basis. With this arrangement, knowing just what the driver costs, tire expense and other minor features, we would arrive at a definite upkeep. If we had trouble with one battery, why there would be but need to replace it. Our battery troubles would be over, we would need less help to care for the cars. Our experience is that repairs on electrics are very light in the course of a year. The battery is the one big feature. There would be no need to maintain an expensive charging equipment, we would buy the battery service just as you come in here and order a barrel of flour. I believe the time is not far distant when such an arrangement can be made. Possibly this can be done in other cities, but if such is the case I am not aware of it. When I can buy 'battery service' the bulk of my troubles will be over. As I have come to the conclusion after trying all types that the electric best meets my needs I shall continue with this type."

The Buffalo Electric Vehicle Company, of Buffalo, N. Y., a consolidation of the various electric vehicle concerns of that city, including the Babcock Electric, and the Van Wagoner Electrics, formerly built by the Clark Motor Company, has recently closed a deal for the entire building at the corner of Main and Barker Streets. New pleasure vehicles will be built here, the structure being completely fitted for such purposes. The broadened plans now under way will allow the use of the extensive plant on West Utica Street, formerly occupied by the Babcock Company, for the manufacture of the new commercial cars and the electrically driven baggage truck.

BAKER ELECTRICS IN HEINZ SERVICE

The accompanying illustration shows the five two-ton Baker trucks which were shipped to different depots of the Heinz Company in Philadelphia, New York, Pittsburgh and Chicago. The running gear is apple green; the bodies are painted white, giving a very striking appearance. These trucks were especially noticed, through the constant clangor of their bells, in a parade through Cleveland streets. In spite of the fact that horses are growing more and more conspicuous by their absence in the streets of the sixth city, the appearance of these Baker Electric trucks attracted considerable attention.

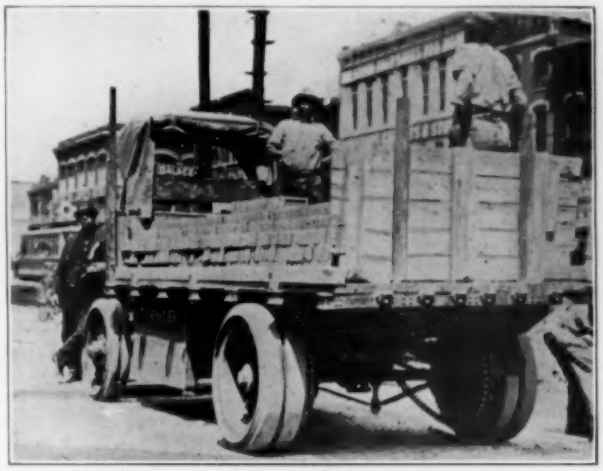
A convincing test of the strength and power of the truck was given to the Cleveland branch of the Heinz Company by the manufacturers.

Baker Electrics Which Distribute the "57" Varieties

OPERATES THREE FIVE-TON ELECTRICS AT $9 A DAY EACH

J. A. Mercier, a Detroit, Mich., contractor, operates three five-ton General Vehicle electric commercial cars, at a cost not exceeding $9 a day each, this including the wages paid the driver, maintenance, tires, battery and car repairs and the like.

It costs $50 a month for charging and housing the trucks at the Edison garage. The three cars have been in service, the second year, average about 35 miles per day, and for general contracting work show an efficiency of two to one when compared with horses. All hauls are comparatively short, and Mr. Mercier points out that in loading brick, for example, much time is consumed, more than would be the case with more bulky commodities quickly taken on and discharged. For long hauls the cars work out three to one. Since installation, batteries of all cars have been overhauled, at a cost of $300 each, so that battery expense is about $1 per day. Asked how he came to purchase the cars, Mr. Mercier replied that it was a case of have something, horses or cars, so he tried the cars, and has been well satisfied with the venture. The cars, he says, represent no particular saving, and the cost of upkeep is about an even break with horse service.



Five-Ton G. V. Electric Used in Hauling Bricks in Detroit

Electric Truck With Motor Winch on Trailer

This five-ton General Vehicle electric, used by the Edison Illuminating Company, at Detroit, is trailing a gas engine driven cable winch. The gas engine is enclosed in the body, controlling levers for the winch outside. There are two large steel wheels at the rear of the trailer and two smaller ones forward. This equipment has been found very useful and effective in hauling cable through conduits.

CARRIES FOUR THOUSAND PIES A WEEK AND DOES ALL THE HAULING

A one-ton Detroit electric commercial car, in the service of H. L. Bowles & Company, operating a chain of dairy lunches in various cities throughout the east and the middle west, carries about four thousand pies a week from the company bake shop to the five stores in Detroit. The average day is about 650 pies, but on Saturdays, when trade runs a little more brisk, about 1000 pies are transported. The car was installed June 2, and is on duty about 12 hours per day. It is stored at a public electric garage and there cared for. The body is made of aluminum, inside and out, and is ventilated. Capacity is 504 pies. As the distance between the bake shop and the five lunch rooms is short, mileage is not great, about 20 to 25 being the most that is done in a day. With a horse wagon it was necessary to make four trips a day to supply the stores. The car does the work in two trips. Carrying capacity is just double. In four years five horses were used to do the work, a horse lasting about a year. Supplies are purchased in carload lots, and the car is used for transportation of these from the storehouse to the bake shop.

Small Detroit Electric, Which Delivers Pies to the Five Dairy Lunches of Detroit of H. L. Bowles & Co.

ELECTRIC ROADSTERS USED BY LIGHTING COMPANY

The Waverley Company, of Indianapolis, have recently filled an order from the Louisville Lighting Company, of Louisville, Ky., for six Waverley electric roadsters for the use of their Trouble and Repair Departments. These are in addition to four light delivery wagons of the same make and for the same service. A box has been added to the rear of the roadsters to accommodate their tools and supplies for quick repair work, while a larger supply of material will be carried in the light delivery wagons.

FIELD ELECTRIC 'BUS COMPANY, No. 30 Church Street, New York City, announces that it is ready to supply the Field Electric 'Buses, some of which have been in use by Carson, Pierie, Scott & Company, of Chicago, for six or eight months, to buyers generally, as they have made arrangements to have these 'buses built by the Ohio Electric Car Company, of Toledo, O.

What Grocers Are Doing With Commercial Cars

Examples of Successful Service

BY E. S. FOLJAMBE

PART II

N ARTICLES of this nature there are occasional cost of operation figures. These, although accurate, and taken from the books of the companies are applicable only to the business and conditions in question. No greater mistake can be made than to generalize from such figures or attempt to apply them without modification to entirely different lines of business.

Gasoline and Electrics Used By New York Grocer

The representative grocery house of Acker, Merrill & Condit, New York City, is now using a fleet of seven trucks, two of which are three-ton Packards, and five G. V. Electrics. All of these machines are performing satisfactorily. The electrics never stop except for charging or new batteries, and the gas trucks average from 275 to 300 days service per year. Of course, some 50 days of the 365 are counted out for Sundays. The electrics are kept in the building with the wagons, where they are also charged, but the gas cars are garaged outside on account of excessive insurance which would have to be paid on the entire building if they were garaged in the stables. The statement was made that probably in the neighborhood of $300 could be saved per year on the cost of keeping these gas cars if they could be garaged and cared for at home.

GROCERY delivery, the same as other retail lines, presents a problem to motor delivery; namely, very short hauls and frequent stops. Grocers generally are using commercial cars for long hauls and suburban deliveries, in which service trucks show a marked economy over horses or railroads. A few are successfully using electrics on the short-haul routes. Special loading facilities apparently have not yet been considered by grocers, with the exception of one or two progressive stores of the Far West. In such devices lie the possibilities of keeping the trucks moving, and making it possible for them to compete with horses on even the short routes. Trucks for this service should be fitted with self-starters.

The following figures are the cost of operating one gas car for a year as taken from the books of the company.

Cost of Operating Gas Car One Year

Days in Operation	270
Number of Loads Carried	516
Mileage	14,474
Total Cost	$3,900

This includes insurance and accident insurance, cost of gasoline, oil, tires, and depreciation figured at 20 per cent.

Drivers

The point was brought out strongly that where only one or two gas cars are used it pays in the long run to hire a high grade driver, while in fleet use, one foreman who is capable of looking after all repairs, is all that is required, and the individual drivers can be cheaper men. In this installation one of the drivers really looks after the mechanical details. He is paid $23 a week. He works overtime when this is required, but keeps the machines in good running order. He has never had to be towed in or his load transferred, but occasionally has telephoned in that he will be a little late owing to some necessary adjustments, but he always gets there and delivers the goods. The other driver is not so well paid, and is not capable of making all adjustments and repairs, and not in-frequently he telephones in that he is stuck and the other truck comes to his assistance. The drivers report at 7.30 in the morning, and go over the machines and oil them while they are being loaded. They get out about eight.

How Trucks Relieved a Water Famine

The delivery work consists principally in carrying goods from the central store at 42nd street near 6th avenue, to their own branch stores in Brooklyn, Flatbush, Williamsburg, etc. These trips are usually made in the morning, and in the afternoon trips to Yonkers, etc., the cars averaging between fifty and sixty miles. Occasionally, longer trips are made, for instance, one day last summer, the 11th of July, an exceedingly hot day, the water-mains at Long Beach, L.I., were broken, and the Acker, Merrill, & Condit Stores were telephoned that if they could not get some bottled water to the Long Beach hotels at once, the guests would have to be turned out. One of the trucks had just returned at 1.30 from a long trip to Far Rockaway, but was immediately given a full load of bottled water, and made the sixty-two miles to Long Beach in a hurry, saving the day for the hotels, and making a mileage for that day of 210. This of course, created good feeling on the part of the customers and brought future business. In such emergencies and many minor ones, the advantages of motor trucks over horses are continually being shown. During the heat of the summer with horses, trips to even Far Rockaway could not be considered.

These cars are not driven over twelve miles an hour, and all the drivers are kept within limits, by the fact that Superintendent Tagg is liable at any moment, just as they are pulling out to jump on and make the run with them. They never know when this is going to take place, and as a result do not plan to do impossible stunts.

The Electric

The five G. V. Electrics each take the place of about four horses. Another electric of the same make has just been put in service. The batteries are guaaranteed for forty-five miles per charge for at least 600 working days, which as Superintendent Tagg says, is very much better than the time when they were glad if they could get twenty-two miles on a charge. A day's test run of one of the electrics was made. The three and a half ton truck was loaded to its full capacity and driven forty-eight miles to Far Rockaway without any trouble, and

Part of Acker, Merrill & Condit's Fleet

This well-known grocery house, of New York, is using two three-ton Packards, and five G. V. Electrics. This shows large doorways through which the trucks pass into the interior of the building where the loading platforms are situated, so the machines do not block the sidewalk, and all loading is done under cover.

with sufficient current still left in the Exide batteries to run a considerable distance.

These electrics are used chiefly in delivering to the city branch stores as far up as 200th street to Brooklyn and occasionally to Flushing and Yonkers.

Cost of Operation of Electrics for Three Years

The following is the actual cost of operation for a three and a half ton G. V. Electric in this service from January 10th, 1909, to January 1st, 1912, or a period of three years:

Tires	$1,372.00
Renewals and cleaning of batteries	726.40
Repairs	489.83
Painting	65.50
Drivers	2,574.00
Current and storage	1,336.00
Depreciation at 15 per cent.	1,665.00
Insurance at $175 per year	525.00
Total	$8,753.73

The electrics are cared for by the man who looks after the lighting plant in the stables. He does everything except the cleaning of the batteries.

The long haul business to points in Long Island was formerly done by railroad, and although the cost of getting the goods to the customer by trucks is practically the same as it formerly cost by railroad, it is very much more satisfactory owing to the fact that the goods are never out of the employee's hands. By railroad, goods were often received either damaged, or bottles of liquor were missing, in other words, the goods are received quicker by truck and much more direct, and there is never any question of the responsibility for pilfering. The goods also are received in better condition, as they get only one handling.

New York Grocery Trucks Compete With Railroad

Another large grocery firm of New York has been trying out for some time several different makes of gas trucks. They now have in service a two and a half ton Mais, a three-ton Packard, a two-ton Garford, and two Alcos. The first truck in service was an Alco, with which they started their motor delivery work about two years ago. Deliveries are made in the Bronx and in Jersey, and to all points within a radius of about thirty miles, the trucks averaging in the neighborhood of about forty miles a day the year round. This long haul work was formerly done by railroad, and required the packing of goods securely to stand four handlings, while now they are put directly into the truck, and are not touched until they reach their destination. Furthermore, the suburban stores had to send to the railroad to get their goods, while now goods are delivered directly to their stores. Another advantage is the fact that goods are often delivered to small stores in places off the railroad lines where it would be ex-

Two and a Half Ton Mais Receiving its Load for Deliveries in Jersey

This is one of a fleet of six gas cars, including Packards, Garfords and Alcos. These trucks deliver groceries to points within a radius of thirty miles, deliveries which were formerly made by railroad.

tremely difficult and expensive to get the goods by rail. Even city delivery work in New York City is very often long haul business, as the distances are so enormous, especially north and south.

Accurate cost records are kept, although no figures could be obtained for publication. Drivers are paid from $16 to $18, and the trucks are garaged outside, which is acknowledged to be expensive, but this is done on account of the increase in insurance rate on all of their stables and buildings when the trucks are kept there.

The statement was made that they could not possibly do away with their motor trucks, and although there were certain disadvantages connected with their use at the present time, conditions are getting better every year.

Grocer Contracts With Teamsters For Motor Delivery

Austin, Nichols & Company, another large grocery house of New York City, is now using two Mack trucks, and four G. V. Electrics, and another Mack is ordered, but this company, instead of owning these machines, contracts for service with Z. T. Piercy, who has been a well-known teamster for years in New York City. The rates are based on the weight of goods hauled, the contracts being made by the year.

The electrics are used entirely for city work within a radius of fifteen miles, and the gas cars are usually run over into Long Island and other distant points, averaging about forty-five miles per day. The two Macks now in service are four tons each, and the new one will be five tons.

Difficulties of Long Island Deliveries With Horses

On heavy loads four horses used to be required to carry the goods to Coney Island, the trip requiring four hours. With the trucks fully loaded they can make the trip to Coney in a little over an hour, and often two round trips are made the same day. Customers were always kicking on account of the late deliveries, when horses were used. Another trouble was experienced with the horses from the fact that they became extremely overheated in hauling the heavy loads, and while in this condition standing on the ferry boats they became chilled, which often resulted in fatalities, to say nothing of delays and blocking of traffic.

New York Truck for Deliveries to Coney Island

The Mack truck shown above is one of the fleet of trucks used by Austin, Nichols & Company, New York, for suburban delivery work, this particular truck making often two trips a day to Coney Island. These trucks are owned by Z. T. Piercy, and are under contract by the year, the rate being determined by the actual weight of goods carried, as shown by receipts.

Chinese Grocer Uses Three and a Half Ton Truck

"Everybody's doing it," applies with much aptness to the use of commercial cars. In this illustration is shown a three and a half ton Alco truck used by Mon Chung Tai & Company, importers of Chinese groceries; a company which supplies a large chain of Chinese restaurants and grocery stores in New York City, and other towns in the state, in New Jersey, and in Connecticut. It is said to be the first motor truck used by a Celestial grocer.

Horses Being Displaced

The experiences of Z. T. Piercy are interesting. This expressman now has several hundred horses and wagons in use, but is displacing them by commercial cars just as fast as possible, and expects eventually to use motor trucks for all work except very short hauls to piers, etc. His business is contract hauling for all kinds of business houses. When contract hauling can be done with motor trucks, to such advantage that horses are being dispensed with for the same work, it is pretty good proof that commercial cars can do the work of horses, and at less expense.

An Unusual Use of Electrics

What might be termed an unusual use of electric commercial vehicles is that of R. C. Williams Company, Grocers, New York City. Three G. V. Electrics are used in the delivery service, these being the only motor driven vehicles employed. They are used for long hauls, going to points in Long Island, even as far as Hollis, which makes a trip of over forty-one miles by the time the truck is back at night. Runs from lower Manhattan, out into the Bronx, and to Van Nest, to Fort George, etc., are made regularly. On these runs the vehicles average about thirty stops, or sixty stops a day where two runs are made.

No gasoline machines have as yet been purchased, and these long hauls are made by the electrics, as they are so much more speedy than horses. Instruments are used on all machines, showing mileage, stops, etc. Cars are garaged outside, and are kept in service, or in running condition for a set charge per month. An extra charge is made for any breakdowns or parts, and drivers are not held responsible for accidents, unless evidence shows rank carelessness on their part.

Excellent Service Obtained in Winter

The drivers are well paid for operating these electric machines, averaging $16 a week each. In the winter the trucks are operated continuously and deliver the goods, but the batteries have to be charged much more often, as "buck-

Electrics Used for Long Hauls

An unusual service for electrics, operated by R. C. Williams & Company, Grocers, of New York. Three G. V. Electrics have been used for over two and a half years, on long-haul work, on trips of thirty-eight to forty-one miles, the cars running as far as Hollis, Long Island; an unusual use of electrics.

ing the snow" materially cuts down the mileage per charge. Helpers are supplied at $5 to $6 per week. These young men know the routes and live in hopes of having charge of a truck in the near future. The regular drivers are men who formerly drove horse vehicles.

Each of these electrics does the work of four horses. R. C. Williams & Company would give out no figures, but stated that the service is so good that they could not possibly do without it, and that in all probability gasoline machines will be put on for the long haul work, leaving the electrics for the city deliveries.

Recording Instruments Valuable

The Finley Acker Grocery Stores, of Philadelphia, have been using Autocars for some time in their delivery department, this particular installation being interesting, not only from the fact that only two cars are used, which it is well known costs more per car than when a large number are in service, but because of their use in the delivery of groceries where many stops have to be made, which is also conceded to be a difficult service for truck efficiency. The first car was taken on, July 9, 1909. In the following spring it was changed to a little later model, and again in 1911 the car was turned in for a still later type. In June 1912 after this experience with the first car, a second car of similar type and make, both being of one and a half ton capacity, was put in service. It may be mentioned at this point that this company, it is said, is the first in Philadelphia to use the International Recording Instrument. These are of the type which makes a continuous record on a ribbon of paper, showing every motion of the car, its stops, and duration of stops, and the speed. The ribbons are taken off each night by the company supplying this service, are gone over, and are received in the first mail in the morning by the owner of the truck. The highest speed at any time during the day is marked with a red hand, and in a circle the speed in miles per hour is indicated. From the record on the strip the length of time at which this speed was maintained is also shown. This complete record immediately eliminates all careless drivers, as everything they do shows. The instruments are not objected to by careful drivers, and according to this company these little devices are invaluable to any truck user.

Solid Tires Replaced by Pneumatics

Both cars were at first equipped with solid tires, but the 1st of March, this year, the first car was fitted with pneumatics, and when the second was purchased it was also so equipped, and thus far the pneumatics are working out well.

Drivers are paid from $14 to $18 a week, and the cars are garaged with the Autocar Service Department.

Small Cars Each Replace Six Horses

Each of these cars, it is estimated, does the work of from six to seven horses. They make on an average of about sixty to sixty-five miles a day, and on very busy days sometimes do over seventy. Horses were formerly used for the suburban delivery work which these cars are now doing, but only four or five out of forty or fifty horses could be picked out for this kind of work, as these deliveries were known as the "horse killing routes." Each wagon had four horses, and as customary with all long haul work, these horses were used on alternate days. Even with the rest in between, as a rule they did not last long, and are apt to get very thin and scrawny looking. With these horses, trips which would total forty-five miles were made, but always with difficulty, at great cost, and with often late deliveries, and more or less dissatisfaction to the customers. The drivers never expected to get back until late at night, but with motors the goods are delivered in good season, and the drivers get home early.

Overspeeding by Early Drivers

Some trouble was experienced with the first drivers on account of their driving twenty to twenty-five miles an hour on solid tires, but these men were laid off, and strict instructions given in regard to speed. Now, however, with the pneumatic tires, these speeds have thus far done no damage. On each of the wagons a $7 helper is supplied. These men know the routes thoroughly, and, in fact, do nearly all of the handling of the goods, and will probably take driver's positions whenever vacancies occur.

One of Finley Acker Company's Autocar Delivery Wagons, on Pneumatics

Two of these machines are now employed, both of which have been changed from solid to pneumatic tires. They are equipped with recording instruments, being one of the first Philadelphia companies to realize the importance of such devices.

Use of Trucks Now No Experiment

Although no record of expenses of up-keep was given at the start, a statement was made that the trucks were performing satisfactorily, and that they had undoubtedly come to stay. Up to two years ago they considered the use of the trucks as an experiment, but now it is a business proposition where long hauls are concerned, but they do not think that matters have progressed to the point where trucks can compete with the horses for very short hauls and many stops. There are, however, some firms in this line of business who are using their trucks for this most severe test on truck efficiency and claim to be doing so satisfactorily. The Acker Company has not as yet tried any electric vehicles for short haul work.

Grocery Uses Trucks Instead of Railroad

The cost figures for six months of trucks used by a Philadelphia wholesale grocery house, which has in Philadelphia and its vicinity over 180 branch stores, and employs four gasoline trucks for delivering to these branches, is here given. The cars are two three-ton Packards and two five-ton Whites. These machines average about 310 days a year in service. The White trucks, since they have been put on in December, 1911, have not been off the street a single day, with the exception of once, owing to an accident due to the carelessness of the driver. As deliveries are made to branch stores, the men at the branches helping to unload, a single driver, at about $15 a week, is all that is needed, thus doing away with the necessity for a helper.

Operating Figures

Cost of One Three-Ton Packard for Six Months, Ending June, 1912

Repairs, Tires, Oil, Garaging, etc.	$497.41
Salary of the Driver	300.00
Depreciation at 20 per cent. per year	238.59
Liability Insurance	39.00
Total	$1075.00

Cost of One Five-Ton Truck for Six Months, Ending June, 1912

Repairs, tires, gasoline, oil, garaging, etc.	$699.73
Salary to driver	390.00
Depreciation at 20 per cent.	420.31
Liability insurance	39.00
Total	$1549.04

No fire insurance whatever has been carried on these machines. The operators are old horse drivers, familiar with the delivery of groceries, who are coached up to the point where they can properly care for the trucks. This company, with many others, had its costly experience at the beginning with professional chauffeurs and high speeds. Now the drivers were not entirely at fault, as those in charge of the delivery, urged them on to cover enormous fields, which meant high speeds, with the usual result, truck practically worn out at the end of six months. This machine was then turned in, and a fresh start made. No driver is now allowed to go over twelve miles an hour, and this is enforced by the use of recording instruments. The trucks are occasionally overloaded from one to two thousand pounds, but this is not common practice. Absolute satisfaction is the result of the present method of handling the vehicles.

Fleet of Two Packards and Two Whites Used by Large Philadelphia Grocer

Motor Truck vs. Freight

The kind of work accomplished is as usual long distance runs to the branch houses. No comparison with horses can really be made, as much of this work was formerly done by railroads, but there is a saving over the railroad, as shown by the following figures. Everything sent to outside points, such for instance, as Bristol, had to be hauled to the station by a team, and if there was nothing there to come back, time was wasted. At the destination the goods had to be hauled by the truck of the branch store. Shipments made one day reached the destination the next morning, and the better part of the forenoon would be gone before they actually arrived and were unloaded at the branch. The cost for freight is $9. With the trucks, the cost of operation for the one-half day required figures as follows:

Cost of Trip to Bristol by Motor Truck

Driver's wages	$1.25
Tires, at 4 1-2 c. per mile	1.92
Depreciation at 20 per cent. on $5,000	1.50
Gasoline	.96
Oil	.15
Total	$5.78

This shows a saving of $3.22 in favor of the truck on each load, to say nothing of the fact that the goods are received at Bristol by the branch store at 9 o'clock in the morning of the same day shipped, as against noon of the following day by railroad. Furthermore, the goods have not been rehandled, damaged or pilfered.

Trucks Save Horses During Hot Weather

Last summer, during the excessively hot weather, when the horse mortality was enormous, this company only lost one horse. This was made possible by working the motor trucks overtime. All drivers were cautioned when the horses showed weakness, they were to be rested, and as soon as possible put in the stable, while the trucks worked from half past six in the morning until eleven and twelve at night, and thus made up the deficiency.

The Daily Report Card

A daily report is made out by the shipper of the performance of each one of the vehicles. One of these cards is herewith reproduced. This is for one of the five-ton White trucks. It shows that it left the wharf at seven in the morning with a

load of 5½ tons of potatoes, and made six calls. The time of arriving and leaving is also shown. In the afternoon, at three P. M., it left the warehouse with six tons of groceries, making two stops. The odometer reading shows a distance of 52.1 miles; gasoline used, five gallons, and lubricating oil three quarts. These slips, which are turned in each day,

DAILY TRUCKING SHEET

Truck No. Driver Date 7-25 12

Material	Quantity	From	To	Arrived	Left	Miles
Potatoes	5½ tons	Wharf	32	10 15	1034	
			86	1044	1052	
			26	1055	1100	
			109	1123	11	
			34	1135	1147	
Groc	Del	Wire	103	1155	1220	
			61	4-23	5 10	
			96	540	6-2	

Gasoline Used 5 gals. Lubricating Used 3 Quarts

Odometer Reading 7122 7/10 Start 3284 3/10 Total Mileage 52 1/10

Miles Per Gal. of Gas

Supplies or Extra Expense

Total Expense

Weather Conditions Road Conditions

Routine Work

Repairs or Adjustments

Remarks

Shipper's Daily Report Card

Form of report used by grocer. A separate card is made out each day for each truck and this record inspected by the superintendent of delivery. Both sides of card are used, the items on the reverse being gasoline and oil consumption, odometer readings, etc.

show distances up to 70 miles, with an average of about 50 miles per day. These cards are gone over and inspected by the man in charge of the delivery service, so that he knows just what both the vehicles and drivers are doing.

The company is very well pleased with the work that is being done by the trucks, and intends to increase the motor truck equipment in the near future.

(To be continued.)

KisselKar Truck With Chemical Equipment

Salina, Kansas, is the only city in the country of its size that can boast of a complete equipment of motor trucks in its fire department.

The last horse in the Salina service was discarded a short time ago for a KisselKar truck, which proved a revelation on its first run. It is officially stated that upon an alarm received at 8.59½ a. m., this new truck sped a little over a mile in 2:01, arriving at 9:02 a. m.

SAMPSON IN OIL SERVICE SUPPLANTS SIXTEEN MULES

Typical of Southern California, and seldom, if ever seen in other parts of the United States, is a five and six-mule team drawing a huge tank of crude oil on the city streets and over the country roads. This method of transporting oil will soon be a relic of the past. The motor truck is fast superseding the slower and more picturesque manner of hauling, and it will be a matter of a short time when the more modern methods will have been everywhere adopted.

One of the latest concerns to dispense with their mule-driven transportation system is the A. F. Gilmore Oil Company, which supplies oil for road work from their wells in the Santa Monica district. The Gilmore Company has recently purchased a five-ton Sampson truck, and has fitted it with a huge tank of 1126 gallons' capacity.

The truck is making three round trips daily from the fields to the beach cities, covering a total mileage of sixty miles a day and displacing from sixteen to eighteen animals. Figuring the up keep of the truck against the cost of feed, harness and care of the mules necessary for the same amount of work, the difference will amount to several thousand dollars yearly in favor of the commercial car.

The Sampson that is in use has not only demonstrated its economy, but has disproved the contention that heavy trucks are not feasible for use in the fields themselves where there are poor, if any, roads. The Gilmore truck has shown its ability to get its load from the well out to the paved roads, and no expense has been incurred in building roadways in the field for it.

NO MORE HORSES USED

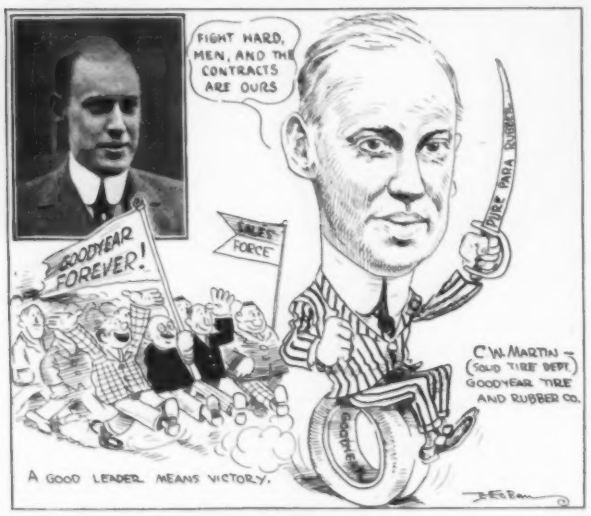
The Pacific Express Company, of Los Angeles, Cal., is using two little Giant trucks. The first was purchased about a year ago, and, owing to increased business, another was put in service some two months ago. The advantages of this type of delivery are not only the decreased expense, but better service, early morning deliveries of fish, etc., being made, which could not be done with horses or by railroad. Horses have been given up altogether. The trucks leave in the afternoon from Los Angeles, carrying supplies and various articles to the Japanese Camp, at Port Los Angeles, remaining there over night, and starting early in the morning for the Los Angeles market. During the day they deliver fish and provisions to their Japanese customers, making thirty to forty stops each. The drivers are Japanese, as they can converse and do business with those at the settlement. The loads are from a few boxes to a ton. The distance from Port Los Angeles to the fishing camp is 28 miles, making a round trip of 56 miles.

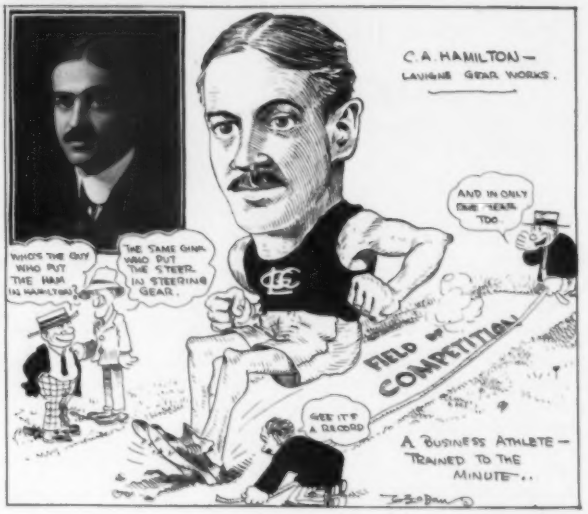
The cars are garaged by them and all repairs made. Depreciation is figured at 20 per cent., and the cost of operation for a month of twenty-six working days, covering 1300 miles, is as follows:

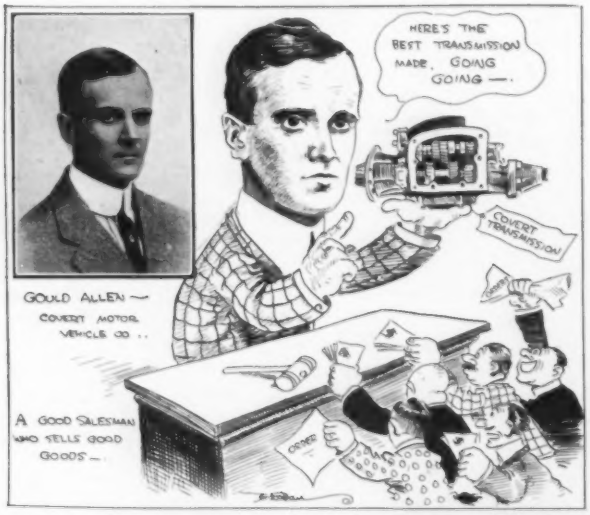
Gasoline	$14.00
Tires	6.50
Depreciation at 20 per cent.	20.80
Insurance	1.50
Driver	60.00
Lubrication	3.20
Total	$106.00

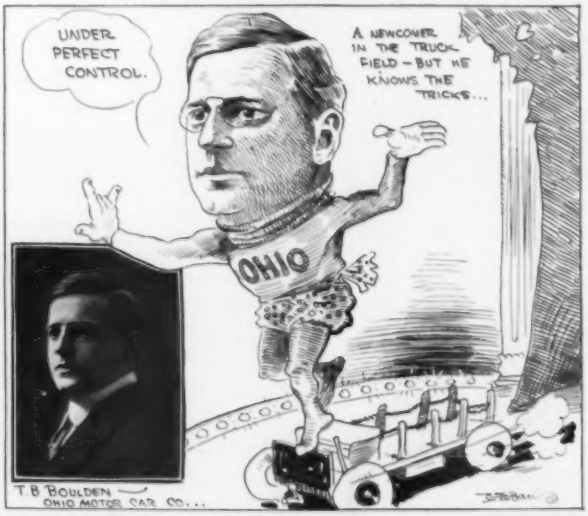
It is claimed that their business has almost been doubled owing to the efficiency of the cars.

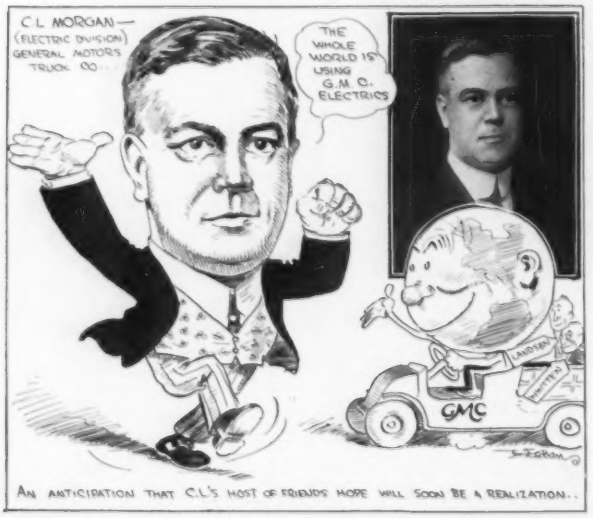
C.C.J. GALLERY of SALES MANAGERS

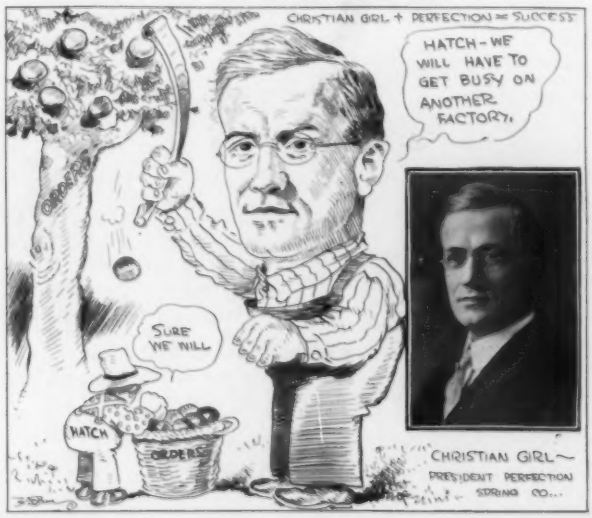

FIGHT HARD, MEN, AND THE CONTRACTS ARE OURS
GOODYEAR FOREVER!
SALES FORCE
PURE PARA RUBBER
GOODYEAR
C.W. MARTIN — (SOLID TIRE DEPT.) GOODYEAR TIRE AND RUBBER CO.
A GOOD LEADER MEANS VICTORY.


C.A. HAMILTON — LAVIGNE GEAR WORKS.
WHO'S THE GUY WHO PUT THE HAM IN HAMILTON?
THE SAME ONE WHO PUT THE STEER IN STEERING GEAR.
AND IN ONLY ONE YEAR TOO
FIELD OF COMPETITION
SEE IT'S A RECORD
A BUSINESS ATHLETE — TRAINED TO THE MINUTE..


HERE'S THE BEST TRANSMISSION MADE. GOING GOING —.
COVERT TRANSMISSION
GOULD ALLEN — COVERT MOTOR VEHICLE CO..
A GOOD SALESMAN WHO SELLS GOOD GOODS —
ORDER




C.L. MORGAN — (ELECTRIC DIVISION) GENERAL MOTORS TRUCK CO.
THE WHOLE WORLD IS USING G.M.C. ELECTRICS
GMC
AN ANTICIPATION THAT C.L.'S HOST OF FRIENDS HOPE WILL SOON BE A REALIZATION..


CHRISTIAN GIRL + PERFECTION = SUCCESS
HATCH — WE WILL HAVE TO GET BUSY ON ANOTHER FACTORY.
SURE WE WILL
HATCH
ORDERS
CHRISTIAN GIRL — PRESIDENT PERFECTION SPRING CO...

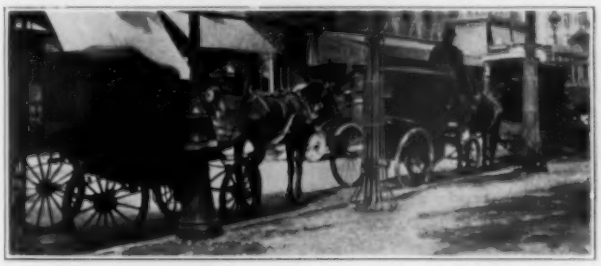
Motor Traction Progress in Paris

BY OUR FOREIGN CORRESPONDENT

THE passenger carrying services of Paris are run under a system by which monopolies are granted for certain routes by the Prefect of Police and the Prefect of the Department of the Seine. These monopolies prevent undue competition, prescribe routes, and insist upon the fulfilment of various conditions. These include stipulations as to the construction of the body-work of the cars, and when recently the time arrived for the renewal of the contracts with operating Companies, the single-deck omnibus was selected to the exclusion of the double-deck variety. The present vehicles have space inside the body for twenty-eight passengers in two classes. There are sixteen first-class seats forward, and twelve second-class seats to the rear of the vehicle, while there is also room on the covered platform at the back for about eight more passengers. These platforms offer the only provision for smokers. The new type of 'bus appears to be far more popular than was its predecessor, as the Parisian has never learned to appreciate the comparative lack of protection of the upper deck, with its fresh air and accommodation for smokers. Although lower prices were charged for the upper decks—protected by canopies—than for the interior of the vehicles, they were comparatively little used, a fact which is interesting when one remembers that in London, with its far colder and more variable climate, the unprotected top deck is, on the whole, perhaps more popular than the interior of the car. The London double-decker carries thirty-four passengers, so that its carrying capacity is practically the same as that of the new type of 'bus in Paris. The Paris 'buses usually run on benzol, on account of the fact that it can be obtained in the city cheaper than gasoline, because of the high octroi duties on the latter fuel.

A Typical Paris Motor Omnibus at the Hotel de Louvre. It will be noted that there is no lack of passengers

As regards cabs, the motor has now practically ousted the horsed cab in the better residential portions of Paris, but the old one-horsed vehicle, the "fiacre," is still to be found in every large numbers in the districts where visitors congregate. It has escaped the doom of the "hansom" and "growler" in London, simply and solely because it has done its best to make itself at least comfortable if it cannot be fast, and to allow its patrons some means of gauging the cost of their journeys.



A Typical Fiacre With Ducasble Tires, and a Cab With Wire Wheels and Pneumatic Tires. The antiquity of the vehicles, the horses, and the drivers is in marked contrast with the modernity of the taximeter and the tires.

This Ducasble is a type of tire which provides something of the resiliency of a pneumatic, without the risk of puncture or the same cost of upkeep. It seems to be found extremely suitable for use upon light vehicles. In a photograph are shown cabs which are illustrated with a view to pointing out the sagacity of the Parisian cab proprietor.

Motor Vans and Trucks

Not many years back practically every motor van in Paris was shod with pneumatic tires. These tires are still far more generally used than on the corresponding vehicles found in London, but they are no longer anything like universal. The Ducasble tire which has already been shown in a photograph of a horsed cab, seems to be very popular. For example, this type is used on the vans carrying fruits, preserves, etc., while the same type of tire is to be seen in the photograph of a Panhard vehicle being used for vacuum-cleaning purposes. In one or two cases such as the last named, the wear on these Ducasble tires which are described by the makers as "Pneu a air libre" seems to have caused the rubber to spread over

the rims, and the tires look as if they would break up while still retaining a high proportion of the rubber originally used in their manufacture.

On the whole, these cushion tires are possibly better suited for quite light weights. Some of the vans owned by the Magazine de Louvre have plain solid tires, and a few large box vans, including big laundry vans are on tires of the same type. However, the pneumatic as has been said, still predominates for ordinary delivery work.

Paris delivery vans appear generally to be driven at a high speed and rather recklessly, but they are better handled than the average taxicab. The most noticeable thing about them is their size which is much smaller than that to which one becomes familiarized in Great Britain. The large van is uncommon, and the petrol lorry more uncommon still. One of the last named class is illustrated, and this is of a type which has not found its way into commercial use in Great Britain. but appears to be getting quite popular in Paris. The system adopted is the Latil front drive. The front wheels are both driven and steered, and the whole of the weight of the mechanism is on the forward part of the vehicle. The back wheels in the case of the heavier lorries are generally steel-tired. It is rather curious that the heavier types of van and lorry are not yet to be found in great quantities in France, since the War Department have for many years past offered quite substantial subsidies to encourage their use. For the purpose of granting or withholding these subsidies annual trials have been held, and if it may be permitted, from a limited experience of the conduct of these trials, one would suggest that the conditions under which they are carried out are not sufficiently severe. They appear to consist generally of quite straightforward runs over flat or slightly undulating country, and as great store is set upon fuel economy, and high power does not appear to be necessary, the type of car produced is on the light side, and would probably be unsatisfactory on very rough or very hilly roads.

A Small Panhard Vehicle on Ducasble Tires Engaged in Vacuum-Cleaning a House in the Place Vendome

Steam-driven lorries are quite uncommon in France. There are only one or two native makes, and specimens of these are occasionally to be seen in Paris. For example, one is shown in a photograph being driven in the employment of the Public Works Department. In the provinces and around the outlying portions of Paris, a considerable number of English-built Foden steam wagons are in use, but one does not find that the type is employed generally by millers, brewers and the like, as it is in England. This can be put down partly to the French faith in high speed and lack of understanding of the possibility of a vehicle which is not designed to travel more than six miles per hour.

A Smart Motor Van Owned by a Well-Known Store in Paris, and Typical of the Type of Vehicle Which Has Come Into Extensive Use During the Past Two Years.

Commercial Automobiles for Municipal Work

The use of motor vehicles in connection with the municipal and national services in Paris is in many respects very interesting, presenting as it does a strange contrast to the almost pre-historic systems which still continue to operate alongside of it. A very large number of motor mail vans are to be seen in Paris, both by day and by night. These vans are in many cases fitted with pneumatic tires, though it seems that solids are now beginning to be used. As among trade vans, it is noticeable that speed appears to have been considered before capacity.

One of the Few French-Built Steam Lorries to be Seen in Regular Employment in Paris. This machine is carrying road material.

Latil and De Dion Combined Watering and Sweeping Carts as Employed in Paris.

This illustration shows the Paris method of throwing rubbish into the street, from every house, for collection every morning, and illustrates the difficulty of dealing with the problem by motors without reorganization of the whole system.

As regards the collection of rubbish and refuse, some complete re-organization of the present system will be required before motor vans can be used to any advantage. Experiments have been made with some extremely large dust collecting vans, but it is difficult to see how motors can be made to pay when stoppages of considerable duration are necessary every few yards. An accompanying photograph shows the kind of litter which is found outside every house and shop. The rubbish appears to be thrown out anyhow, and the lighter portions of it are subsequently blown about so that the work of collecting, cleaning, and the process of sorting, which, as will be seen in the illustration, is carried out while the collecting carts are waiting, all take a very long time. An illustration shows a De Dion watering cart, while a somewhat similar vehicle, fitted with a sweeper as well as two sprinklers, is to be seen standing behind another combined street watering and sweeping vehicle operated on the front-driven Latil system. In the Latil the sprinklers are about mid-way along the length of the cart, and the brush is set obliquely beneath the back axle. In the De Dion the sprinklers are in front, and the oblique brush amidships. Various other types of municipal motors have been experimented with. These include simple motor-driven sweepers and sweepers with small spraying jets designed merely to prevent dust, and not intended for thorough street watering.

So far as one can judge by the use to which the vehicles are at present put, the types illustrated are the most likely to survive.

The Commercial Car and the Furnishing Trades

EVER since the wonderful revolution in style and character which the furnishing trade underwent in the latter part of the eighteenth century, the name of Gillow has maintained in the furniture world a wonderful and worthy prominence. Gillow in fact ranked with Chippendale and Sheraton, with Shearer, the Adam Brothers, and with Heppelwhite. The name is still preserved to the trade in the renowned firm of Waring & Gillow, Ltd., better known to the European public as "Warings."

At present the firm is using ten motors in all, one 5-tonner, three 3-tonners, four 2-tonners, one 15-cwt. van, and a steam tractor. As, however, this last mentioned vehicle is of a type not used in America, we will not trouble to deal with it here.

All the vehicles, with the exception of the little 15 cwt. Argyll van (which has done wonderful service for seven years and is still in first-class running condition) come from the Commer car shop at Luton, and thus standardization, both in chassis and body work, is embodied to a considerable extent.

Requirements in the Furnishing Trade

Furniture requires skillful packing, but even with the most efficient packing, is usually bulky, weight for size, and consequently a roomy type of body is employed. The standard body is therefore 12 ft. long, 6 ft. wide, 6 ft. 6 in. high, but on Messrs. Warings' 5-ton chassis there is mounted a giant body 15 ft. long, 7 ft. 6 in. high, and 7 ft. wide.

Warings' requirements are often very stringent, for owing to the nature and the value of the goods, delivery from the warehouse direct to the customer is of the utmost importance, and transhipment is a matter to be avoided at all costs. Only lately the firm had a single consignment of valuable old gilt furniture worth $11,500, which they packed and conveyed in a single van, and another point is that they always insist on their own staff unpacking china, glass and similar commodities, and bringing the empty cases and other packing back with them.

The average daily mileage of the cars is about 50 to 60, but sometimes a vehicle may be called upon to do anything from 80 to 120 miles per day, though of course in such cases

Waring's Fleet of Motor Trucks

Note the big five-tonner, with the sling body, in the middle of the group; also the little Argyll car that has done good service for seven years

it has to be loaded up overnight. On distances of more than 120 miles the driver has to be away for the night.

Keeping in Touch

Naturally in a business necessitating such irregular running requirements it is not an easy matter for the manager to keep uninterruptedly in touch with all his drivers, but it is done by the simple expedient of insisting on every driver not returning at night, sending to the office a postcard stating his whereabouts and advising them of the place at which they can be got in touch with on the following day. A good example of the value of this method of the maintenance of communication between the Despatch Manager and his respective drivers was afforded at the beginning of the recent coal strike. The firm had been relying on sending by rail to Avonmouth some valuable old mantelpieces weighing about a ton for shipment on the Canadian Northern Railway Company's, S. S. "Prince Edward." The strike, however, necessitated their conveyance by road, and the mantels were accordingly placed on a 3-ton car, making up half a load. At Bristol the car took on another half-load and safely delivered the whole to the "Prince Edward." While the vehicle was proceeding between Bristol and Avonmouth news reached the head office that a load of furniture was waiting to be brought to London from Salisbury. By means of wiring to the "Prince Edward" the head office got into telephonic communication with the driver, who, instructed to call at Salisbury on his way back, was thus enabled to obtain a paying load each way, and double the usefulness of this journey. Such deliveries could not possibly be effected with horses.

A Three-Ton Truck With a Two-Ton Trailer, Employed by Warings

Three-Ton Trucks With Two-Ton Trailers

The firm are working their 3-tonners in rather an interesting combination with their 2-ton trailer, and although the general impression is that the use of trailers with rubber tired vehicles is apt to cause excessive wear of the rubber, Messrs. Warings report that they experience no undue wear in the back tires; in fact, although the driving stress is transmitted through the back twin tires it is the front singles that wear most rapidly, due no doubt, to the effect of the steering. The only effect that trailers have on the 3-tonners is to lower their speed, which is a matter of no moment since the speed of cars with trailers is limited in this country to 5 miles per hour. Accordingly the case is met by merely altering the gear and using a chain sprocket wheel with two less teeth than standard. One of these combinations on a recent run of 168 miles, according to the computation of the Despatch Department saved no less a sum than $40 as compared with horse traction.

Some Economics of Motor Traction

Here are one or two examples of how motor transport is saving money for its adherents. On the Monday before Easter last, two 2-ton cars and the tractor hauling two trailers took a consignment from London to Crowborough in Sussex (about 40 miles from London). The car did the return journey comfortably in the day but the steam tractor having two trailers (and a consequent speed limitation of 3 miles an hour in the country and of 2 miles per hour in town) did not get back till the Wednesday. Even in that case however the transaction was a very satisfactory one to them for it is calculated that horse traction would have involved the use of five 3-horsed vans—15 horses in all, to say nothing of the additional number of men.

Another case:—every year at the beginning of the River season, Warings send a box-van loaded with furniture to the boathouse of the Phyllis Court Club at Henley, a distance of 35 miles from London. The journey used to occupy the horse-vans 3 days and cost $75 in addition to the men's wages. Now it is done by a motor in a single day at a cost of $10.

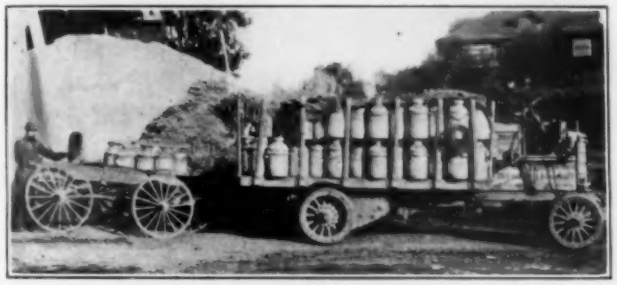
One more case has reference to the deliveries at Gerrads-Cross, a rising residential centre exactly 20 miles from London. This being a 2-days' run for a horse van costs $15 to $20, but by motor is done easily in a 1 day run for less than $10.

The firm carry out all their repairs practically to the rebuilding of a chassis. One thing which impressed one particularly is the selection of spares and the arrangement in the stores. The engineer is justly proud of the fact that the firm lock up no more capital in spare parts than necessary, and although they stock only just enough and no more, he tells one with pardonable pride that he has never yet been hung up for the want of a spare part.

Co-operation with our readers is one of the principal policies of the "C. C. J." If our transportation experts can give you advice in any matter write to us, and we shall be pleased to give you all the information we can through our reading columns.

TRUCK IN SERVICE OF RAAB CREAMERY

The truck took the place of one four-horse team and three two-horse teams which had been carrying the milk from the gathering station at El Monte to the distributing station at South Pasadena. To do this work, it took at least twelve horses, sometimes more, four men the greater part of the time and including interest and depreciation, cost $300 to keep them going. The truck, for the past eighteen months, has cost from $325 to $340 per month to operate. Of this cost of operation, $100 is for depreciation and $28 is interest. In computing the cost of the horses there was no rental counted for the building and space occupied by them, which,



Truck With Trailer Takes Place of Four Teams

The Sampson Truck shown in the illustration is owned by the Raab Creamery, South Pasadena, California, and can be seen, together with its trailer, loaded with milk cans. This truck has taken the place of a four-horse team and three two-horse teams and has come up to the expectations of the owner.

of course, would be greater than that of the truck which takes really no room at all, as it is left standing under the unloading shed. Another point which should be taken into consideration is that the cost of hay and feed has been so much higher since they used the truck that the expense of keeping the horses would have been raised to the same figure as maintenance of the truck, and we are very hopeful that the truck will last quite a number of years after the depreciation charge will have wiped all costs off the books, for at the present time the driver stated that after having travelled 18,000 miles it was a better truck and in better condition than any new truck he had heretofore driven.

The expense for driver has been from $80 to $100 per month; for fuel, about $50 and oil about $15, leaving about an average repair bill of $60 per month, most of which has been for tires. The truck was run into once by a large sixty-foot interurban electric car, which dislocated the bed of the truck slightly and smashed a dozen or more cans of milk; the truck, however, was able to go on its way and lost but a few minutes of time, but the electric car unloaded its load and went back to the shops.

Our principal trouble has been with the tire expense, as with the exception of one set of tires we have had none which have run over 4000 miles. However, the tire manufacturers are coming to the rescue with tires which they are guaranteeing for 10,000 miles. This will make a very material cutting down of the running expenses, especially as the tires are cheaper, as to the first cost, than the old inferior kind.

The road from El Monte to South Pasadena with the load, is uphill every foot, unless it be at the railroad crossing. This has been an especially heart-breaking job for horses, when every moment was precious, and we feel that by being able to put this on the truck there has been a large gain from a humanitarian standpoint. Of course, this continuous upgrade, most on oiled roads, also makes it a very hard pull for the truck, especially with the hot weather coming the oiled roads get soft and rubbery.

HAS THE PROFESSIONAL DRIVER OUTLIVED HIS USEFULNESS?

Has the professional driver outlived his usefulness? Why ask such a question? For the reason that many services are conducted with teamsters in charge of cars. Do the teamsters get along nicely? They surely do, if we are to accept the statements of the owners.

The chief objection to the professional chauffeur seems to be that he is prone to carrry out things according to his own ideas. Now, always to do as the other man orders comes hard with some men. This is true of the so-called mechanical drivers; however, let us give them credit for knowing their trade. They are ordered to do this or that and they question, Why? And in questioning why, they immediately get the boss on the ragged edge, if the colloquialism is permissible. As one manager states, "The professional will do things his way in spite of all that you do or say, he knows it all and you know nothing, according to his point of view.

"Give me a good teamster who has been in the service for some time and he will do better by you than a man who has been a truck driver previously. I mean one of the so-called "mechanics." The men who pay the bills say they prefer the teamsters, because they are loyal to the service. To get on a car is a promotion and to have charge of $3,000 worth of equipment is something of an honor. Possibly one may gather that the users are prejudiced, but consider that these men make their statements after having had both kinds of drivers.

One of these drivers, a former teamster, had to wait about three-quarters of an hour before he could load and how did he employ that time? He brought forth some cloths from the tool box, lifted the hood and polished the engine, every movement suggesting respect for that mechanism. In response to inquiry he stated that he did this sort of thing every day, because it was a nice looking engine and when the hood was raised he wanted it to look right. He devoted like attention to other parts of the car.

It is to be regretted that the professional is so often found wanting, but it would appear that he can be gotten along without very handily. Figures, they say, do not lie and what a

story they do tell, so that is why the professional is frowned upon. Many users point out that his initial experience has come from pleasure car manipulation and he cannot conquer his impulse to drive fast and that, of all things is against him. Any user who has had his troubles states frankly that the drivers have had him worried, but teamsters have proved the solution. The term "teamsters" is used advisedly; consideration is of those of common sensed dispositions. Some teamsters are better on the coal cart and even there what havoc they work. The horse cannot long withstand imposition any more than the commercial car.

THE WATERBURY ICE CORPORATION, WATERBURY, CONN., SAVED $3920 HAULING 14,000 TONS OF ICE BY MOTOR TRUCK

The advantages and serviceability of a motor truck as compared to those of a horse drawn vehicle of similar capacity, is beautifully illustrated in the following comparison. In summer ice is perishable, time is precious and there the rapid transfer from point to point and the least possible handling are much considered factors. To facilitate this considerably important item, the Waterbury Ice Corporation has installed a Sampson truck. Horse hauling cost 60 cents per ton to draw three tons, on each of three trips daily, between ice house and loading platform, a total of 18 miles.

The Sampson truck, under identical conditions, averaged 4½ trips daily, drawing 590 tons per month at a cost of 32 cents per ton. Thus the motor truck saves 28 cents on every ton, and $1.40 on every trip, including every item of expense in both cases. This is a saving of $165 on 590 tons and $3920 on 14,000 tons. No horse truck has ever made more than three trips, while the Sampson truck made nine trips, whenever necessary. When horses are idle they must be fed; with trucks the expense stops when the vehicles cease work. The actual saving created a reserve for overhauling and new tires when needed.

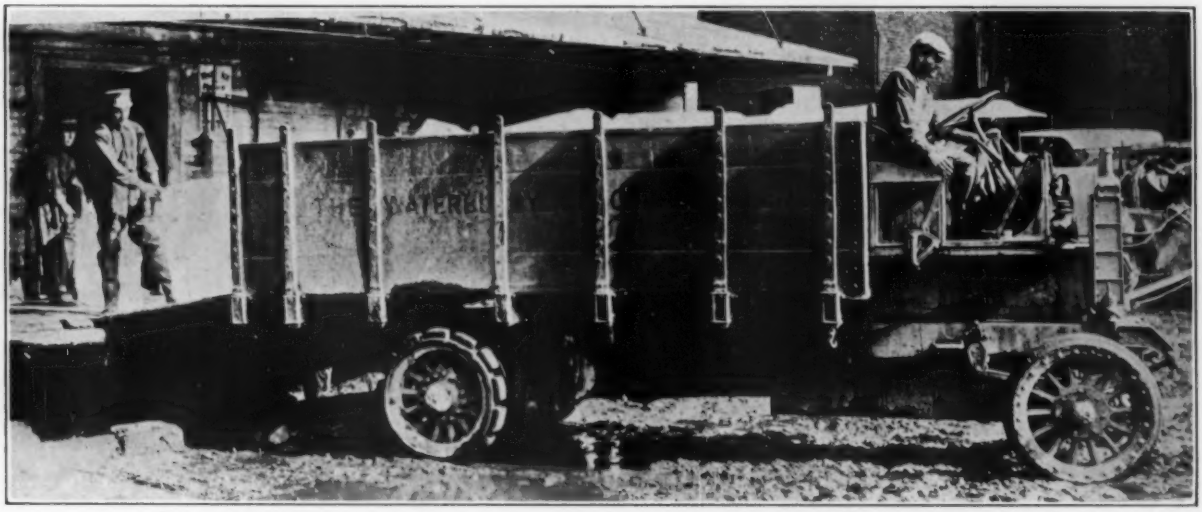
What has been done in the ice business can be done with equal economy and efficiency in other perishable lines.

COST OF HORSE MAINTENANCE HAS INCREASED

Cost of horse upkeep has materially increased in the past three years according to a man formerly engaged in horse trucking but now at the head of a delivery system of a mixed nature. "I pity," he said, "the expressman who now tries to make a living with horses. Feed has increased in price during the past two or three years, this being true of all sorts of fodder. Oats were to be had for 36 cents three years ago. Now they are 64 cents, or an increase of approximately 78 per cent.; corn formerly at 49 cents is now 80 cents, an increase of 63¼ per cent.; hay formerly $12 a ton is now $27 or $28, or an increase of 225 per cent.; bran and middlings formerly $18 to $20 a ton are now $30, or an advance of 66 2-3 per cent. When you come to express the advance in percentage it shows rather a stiff rise."

Still Doing Duty

Here is shown an old two-cylinder car which was considered by the former owner as "pretty well gone." The new owner, Murray W. Sales & Company, Detroit, Michigan, uses the car in the wholesale plumbing trade and finds it quite useful. The driver states that the vehicle works very well, and some idea of the loads carried is to be had from the illustration. The car is used throughout the city of Detroit, and therefore is called upon for long trips. It is the first car for this concern.



The Sampson Truck That Saved $3920 Hauling Fourteen Thousand Tons of Ice

PIERCE-ARROW TRUCK IN SERVICE OF CREAMERY

This Pierce-Arrow Truck leaves the Towar factory every morning with a load of wholesale bottled milk and cream which it distributes to the grocery stores and factory dining rooms on the east side of Detroit. It takes from 3 A. M. to 1 P. M. to peddle this load and make collections, etc. The truck, of course, brings back empty bottles and crates which weigh about three tons. It formerly took three teams and one single wagon to do this work.

On the truck's return to the plant at 1 o'clock it makes two trips to the railroad stations for milk, loaded with five tons each trip. The second driver takes the truck at this time, 2 o'clock.

Pierce-Arrow Five-Ton, Worm-Drive Motor Truck Used by Towar's Wayne County Creamery, at Detroit, Mich. Two shifts of men operate this truck twenty-one hours a day.

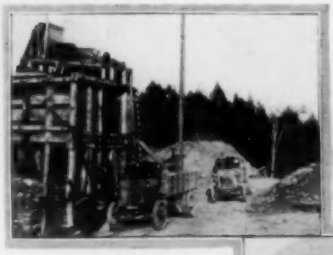
The truck now makes a trip to the north end branch, a distance of four miles, with a full load of bottled goods to be delivered the following day by the wagons stationed at this branch. On the return trip it has a full load of empty bottles weighing four tons. The truck then makes another trip to this branch with the same load. Upon its return at about 6 o'clock, the crew has its lunch. Two trips to the railroad depots for supplies follow lunch, then one trip to the east side branch, a round trip of 10 miles. Upon its return from the east side there is usually another trip to the railroad station.

The afternoon and evening loads are all five-ton loads with an overload of one-half ton occasionally. Mr. Towar estimates that it would take five large teams to handle this afternoon and evening work, while now it is done with two men on a Pierce-Arrow truck.

TRUCKS SUPERSEDE HORSES

These trucks are in the service of the Bridgeport Hydraulic Company and are used for the purpose of hauling stones, cement, material and supplies to a huge storage dam, which they are constructing about six miles from the city. Although to date these trucks have only run up a mileage of about 2500, their service has been so satisfactory that practically all the horses, formerly used in this work, have been superseded.

In this service the trucks have to contend with a considerable number of grades and various road conditions, aside from the unusual rough use forced upon them due to the heavy and irregular loads, and yet they have stood the test and shown their superiority over the old methods of hauling.



Trucks Being Loaded

The trucks are backed up to a long warehouse and are being loaded with bags of cement. The iron wheels with iron spokes, also the housing for the drive chain can be seen. The rear wheels are of the dual type.

Trucks Under Heavy Duty

Locomobiles used by the Bridgeport Hydraulic Company, for hauling material and supplies a distance of six miles, mostly over rocky roads and numerous grades.

MOTOR APPARATUS will be used exclusively in the Youngstown, O., fire department instead of horses; and the Council has approved of a $70,000 bond issue for the purpose of raising funds to purchase same.

Exclusive Motor Delivery of the Higbee Company, Cleveland, Ohio

Four delivery motor trucks are used exclusively by the Higbee Company, Cleveland, Ohio, one of the largest dry goods houses in that city. On removing to the new store on Euclid Avenue horses were disposed of and the work is now done by five fifteen hundred pound White, four-cylinder gasoline cars and three one thousand pound Lansden electrics. The Higbee Company is well situated as to loading facilities: There is a large asphalt-paved courtyard in the rear of the store with a commodious approach from the street. The cars are backed up to the platform, which is sheltered by an overhanging sloping roof.

White Heavy-Service Dump Truck

THE hauling of such materials as coal, earth, crushed stone, common bricks, cement, sand, gravel, slag, cinders, etc., is work which motor trucks, so statistics tell us, can perform with remarkable efficiency and economy. To give maximum results, however, a motor truck used for hauling these materials should be equipped with a properly designed body.

To this end the White engineers have bent their efforts and in consequence have designed the White Heavy Service Tail and Side Dump Body Trucks.

Dump Body Models

Two standard body models are made by the White Heavy Service Dump Truck; one of these permits the load to be dumped at either side of the truck, the other is made with dumping gates in the rear end only.

The side dump model is built with large dumping gates in either side of the body; if necessary, small gates may be built in the center of the larger gates, for use when it is required to deliver the load into a chute or other small opening. The end dump model is built with one large dumping gate in the rear end of the body; a small gate within the larger one may be provided for use when it is required to deliver the load into a manhole, etc.

When dumped, the body tilts to an angle of 45 degrees. This angle is greater than the natural dumping angle of the material carried, and insures a clean, prompt evacuation.

The Power-Driven Dumping Mechanism

The power driven dumping mechanism on the White Heavy Service Dump Truck consists of a power dump screw operated by a chain from a power transmission. This power transmission is made by extending the main shaft of the transmission; on this extended main shaft which terminates in a universal joint connecting it with the drive-shaft, is placed a loose running sprocket wheel for driving the chain running to the dump screw. The main shaft may revolve without turning the sprocket or universal.

Between the sprocket and universal is a positive steel clutch which revolves the main shaft and can be shifted back and forth upon it. Thus, by operating a lever at the side of the driver, the positive steel clutch can be thrown into mesh with the universal joint and so drive the truck, or it can be shifted forward to engage the sprocket and release the universal; when the universal is released and the sprocket engaged, the power is transmitted to the dumping mechanism.

After the positive clutch is enmeshed with the sprocket driving the dump screw, the action of the dumping mechanism is then controlled by the regular clutch and the change-gear lever, which in the regular way, are used for running the truck.

When the power dumping mechanism is in action an automatic trip arrests the action of the dump screw when a tilt of 45 degrees has been reached. In a similar way the action of the dump screw is automatically arrested when returning the body to its normal position. The body may also be tilted to any intermediate angle within 45 degrees and held in that position while the truck is in motion, making it possible to spread the load while dumping, if desired. Both side and end dump bodies are operated by a dumping mechanism of the same design.

The power transmission is entirely enclosed in the transmission case, which is divided into two compartments; the forward compartment contains the regular transmission gears —the rear compartment contains the sprocket, clutch and universal.

The White dump body and controlling mechanism can be adapted to any size of White Motor Trucks.

White Dump Trucks can be supplied with the dumping mechanism to be operated by a hand-crank instead of being power-driven.

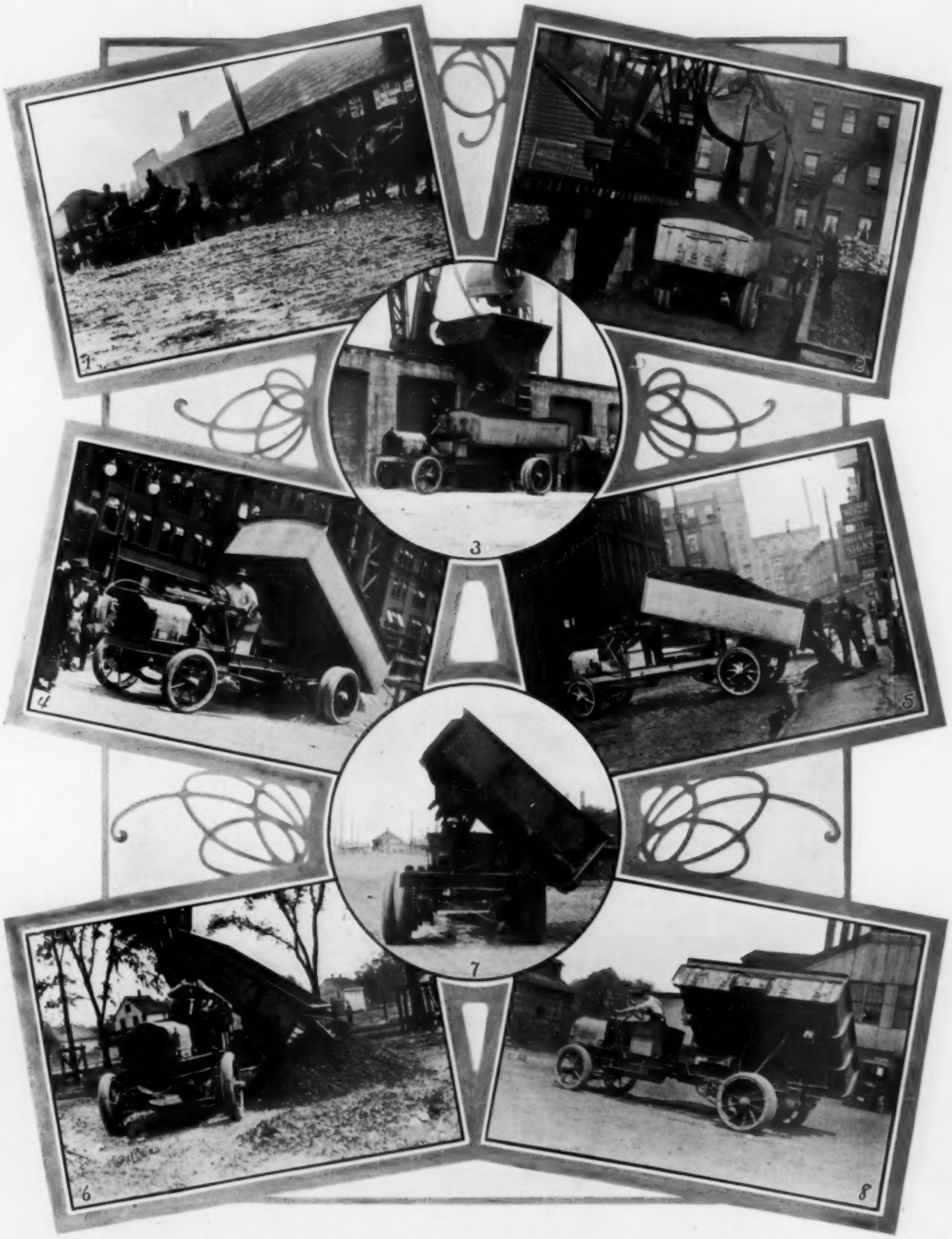
These trucks as above described and with such dump body designs are manufactured by the White Company, Cleveland, O.

SAVINGS BY PEERLESS TRUCK

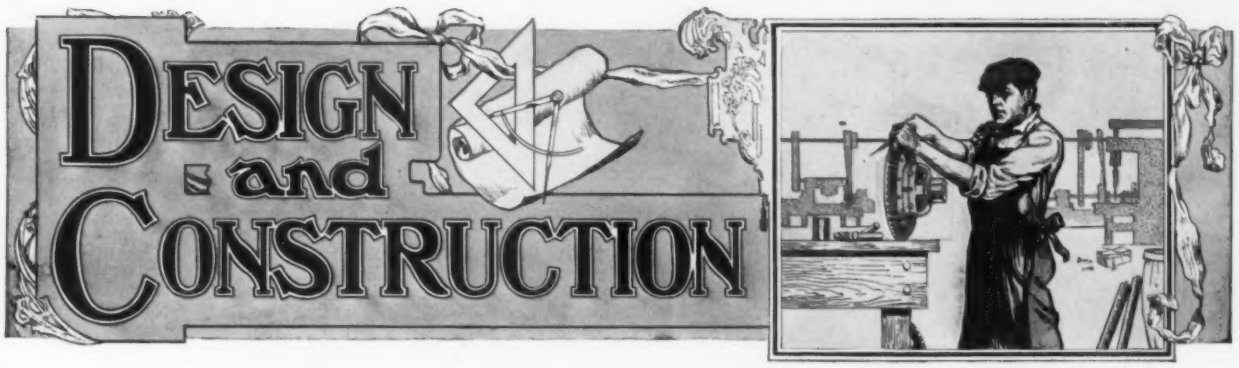
A Peerless five-ton truck saves its owners, the Howell Condensed Milk and Cream Company, of Jersey City, $3139 a year in ferry tolls alone. The company hauls every night a large quantity of milk from Jersey City to a point two miles in the interior of Staten Island. The truck makes two trips with 100 40-quart cans, each weighing 110. The present route covers a run of eight miles from the distributing station Jersey City to the Bergen Point Ferry and a run of two miles after reaching Staten Island, making a round trip of 20 miles or forty miles for the night's work. The ferry tolls are 35 cents for each passage or $1.40 per night. Two teams used to leave the distributing station and proceed via the Erie Railroad Ferry to New York. The toll for this trip was $1.00 for each team. Across Manhattan it was one mile to South Ferry, and the ferry toll from South Ferry to Staten Island was $1.50 for each team. This amounted to $10.00 per night for two round trips for two teams as against $1.40 for the truck. As the truck works every night in the year the saving is $3,139.

Commercial Van Used by Central Storage Company

One of the commercial cars used by the Central Storage Company, of Detroit. The body has doors on both sides and the rear, allowing easy access to any part of the van. The car is an assembled proposition, recently acquired in a private sale, and is of the three-ton four-cylinder type, with a closed body of special design. The car is kept at the storehouse of the company and one of the drivers does much of the work.



1. White Heavy-Service Dump Truck carrying five tons of coal up a steep hill in Cleveland, Ohio. As shown, it requires seven horses, with three drivers, to pull a similar load up this hill. 2. The Heavy-Service Dump Truck being loaded with coal. 3. Same Truck being loaded with crushed stone. 4. The crushed stone being delivered—Note method of dumping at rear. 5. A five-ton load of coal being delivered into a manhole. 6. White Heavy-Service Dump Truck unloads quickly and thoroughly with side-dump body. 7. Rear view of side-dump model. 8. Side view of side-dump model in dumping position.



The Enclosed Chain Drive

BY C. T. SCHAEFER, MEMBER S. A. E.

IN PRESENTING this article, the writer does not wish to go on record as condemning the open chain drive or any method of shaft drive. However, the object of this article will be to present the advantages of the enclosed chain drive. Although the writer's object was to deal only with this type of drive, it was found necessary below to compare same with the open chain, shaft (bur or worm), and the internal gear drive. Illustrations have been carefully selected so as to depict all the various types in use at the present time.

However, before discussing the advantages and disadvantages of the various types of chain cases, it might be well to mention a few words in connection with the development of the chain and its history.

The first application of chain driving to present itself was on the bicycle, the block chain being used at first, and later replaced by the roller chain. The advantages found in the roller is that it rolls over the sprocket teeth when coming into engagement, instead of sliding, as in the block type.

The advent of the automobile called for improvement in chain construction, owing to the greater power that had to be transmitted. The exposure of the chains to mud and dust, also the want of lubrication, made it hard for manufacturers to put out a satisfactory article. Continued study and experimenting by chain manufacturers with various types of chains and materials has resulted in an appreciable gain in efficiency and wearing qualities of these chains.

At the present time the rivets and bushings of roller chains are made from nickel steel, hardened and ground, while the rollers are made of mild steel. The improvement in the wearing qualities of the chain is evidenced by the fact that the same size chains which are now used to transmit 50 h. p. were formerly barely adequate for 10 h. p.

In line with the improvement in the roller chain comes the introduction of the silent chain, which has replaced the roller chain in several cases, as it possesses certain advantages not to be had in the roller type. No matter how carefully a roller may be made or what materials are used, in the course of time the sprockets will wear appreciably and become hooked, causing the chain to elongate, owing to the inevitable wear on the pins and bushings. In the silent type, as the chain rolls off the sprockets, the flat surfaces of the links make direct contact with the sprocket teeth and maintain this until the chain has left the sprocket.

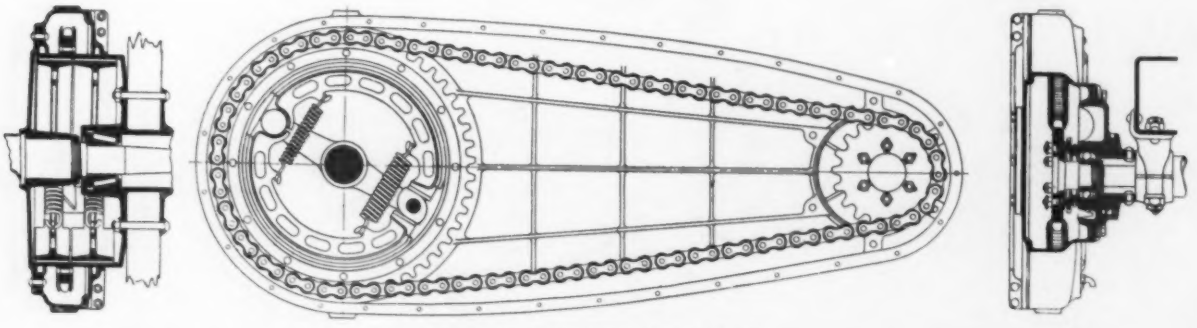


Fig. 1. The Natco Chain Case

In this type of chain case, the case and radius rod are combined, the adjustment being obtained through an eccentric adjusting member. The case is supported at the rear axle and on the brake shoe support, which is riveted solid to the main case casting, while the upper end is supported by the chain case adjuster. To increase or decrease the distance between the rear axle and the jack shaft, the chain adjuster is rotated on the countershaft end housing by means of a spanner wrench, the rotating and stationary parts being permanently locked when the desired adjustment of the chain is obtained. This chain adjustment can be made without removing the cover of the case. An inspection plate is provided for inspecting the chain and for replenishing the oil supply.

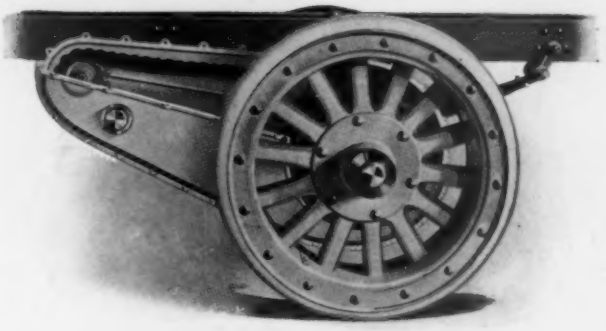


Fig. 2. The Stegeman Chain Case

This shows a type in which the case is also used as a radius rod; however, the cover is divided into two parts so that the upper half may be removed and the chain inspected. With this method it is not necessary to drain the oil from the case, as the parting of the two halves of the cover is at the center of the case, leaving ample space to retain the oil. A plug is provided in the lower half of the cover for replenishing the oil supply.

This chain is at present being used on a number of cars as the center driving member from a friction transmission to a jack shaft.

In connection with the vast improvement of chain construction comes the chain case. Although a comparatively old feature, it has been introduced in commercial cars to reduce the attention this method of driving requires when exposed, the points desired being better lubrication and longer lived chains.

In fact, this subject is receiving much consideration. A number of very neat and satisfactory constructions are now offered by American makers of small and large trucks, and it has been predicted that enclosing chains will become general practice within a short time. Merely enclosing the chain in a dust proof case, using grease as a lubricant, effects a decided saving. This can be further improved by making the case oil tight, with provision for an oil bath whereby the chain may run partially immersed in light oil, or by providing a drip feed on the chain. The advantages claimed are less noise and a freely meshing chain, which results in economy of power, minimum wear on both chain and sprocket and a satisfactory method of power transmission.

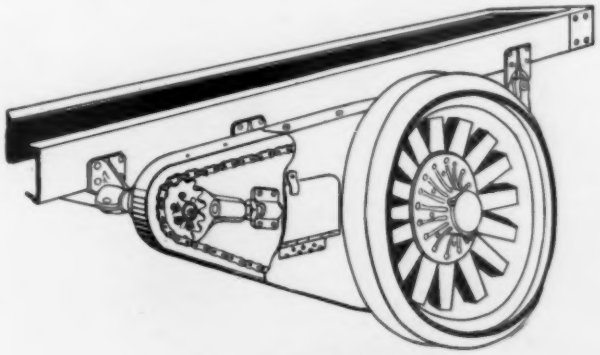


Fig. 3. Avery Chain Case

A type of case built up from a steel casting and pressed-steel parts is here shown. A yoke fitted over the jack-shaft housing is provided with a boss, which is topped out to receive the turnbuckle provided for making the chain adjustment. A bracket bolted to the cast-steel housing forms the other part of the adjustment. The cover is built up from pressed-steel parts, the holding bolts passing through the two halves in a vertical position. Slip joints are provided at the jack-shaft end to take up the adjustment. On the cover a sheet-steel door is placed to permit reaching the adjustment, also for inspection and replenishing of the oil supply.

The construction of these cases may be divided into three types, i. e.:

Type 1. The type combining the radius rod and the inner member of the case as one, and permitting the use of grease as a lubricant.

Type 2. The type having the radius rod and inner member as separate elements, rods placed inside or outside of case, but permitting the use of oil or grease as a lubricant.

Type 3. The type acting only as a mud or dust guard, and being independent from the radius rod.

These three types may again be sub-divided into several types of either pressed steel case, built up from pressed steel parts, built up from sheet steel and angles cast in one piece, or in parts, or a combination of pressed or sheet steel and castings.

When casting is resorted to either aluminum or steel is used, depending upon the nature of the design and cost. Aluminum is generally used where separate radius rods are used and for the covers of Type one, which are generally cast steel, the latter method being resorted to to lighten the construction. The eccentric adjusting members are invariably made from bronze.

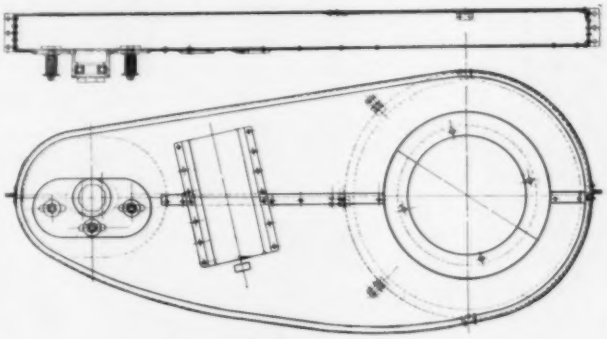


Fig. 4. The Knox Chain Case

This cut shows another type of steel case, but being built up from sheet steel instead of pressed-steel parts. The radius rod is carried outside of the chain case, while the front end of the case is provided with a slip joint and supported by a ball bearing. This case is divided so that the upper half may be removed for thoroughly inspecting the chains, the lower half, carrying the bearing, remains stationary. An inspection door is also provided, to be used for replenishing the oil supply.

In some cases the cover is divided, while in others the entire case is divided, so that the chain may be inspected without disturbing the entire drive. Inspection doors or plugs are usually provided for replenishing the oil supply. In fact, a large variety of chain case construction may be found on American 1912-13 trucks, the advent of the internal gear and worm drive being largely responsible for the sudden introduction of this large number of chain cases.

Several illustrations are presented herewith to depict just what is carried out in practice; in fact, the designs have been worked out very carefully, so that the chain is thoroughly protected and the adjustments so arranged that they may be made as easily as in the open drive.

Type one is depicted in Figs. 1, 2 and 3, the Natco, Stegeman and Avery, while the Sampson and Rapid also employ similar cases. Type 2 is depicted in Figs. 4, 5 and 7, the Knox, Merchant & Evans and Lozier, while the Kissel car and numerous others also use this construction. Type 3 is depicted in Fig. 6, the Barker, while this construction is also greatly used on delivery wagons having a friction transmission and center chain drive. In the Lambert trucks this provision is only made on

the driving end, the case being cast in two halves, the upper half being provided with a door for inspection.

Certain advantages and disadvantages may be offered for either type of construction. However, it will suffice to state that the construction in commercial car work should be such as to eliminate all possible guess work on chain adjustment and attention required in service so as to reduce the maintenance to a minimum. The most important part of this method of power transmission is the adjustment, which should at all times be readily accessible without disturbing the case proper, but should be so arranged as to provide an equal adjustment so that the most careless driver or mechanic can see that both are taken up equally. Lack of this refinement will result in excessive wear on sprockets, chains and tires. The wheels, when not set to track with the front, will cause the tire wear, while as the jack shaft is permanently attached to the frame, it is in

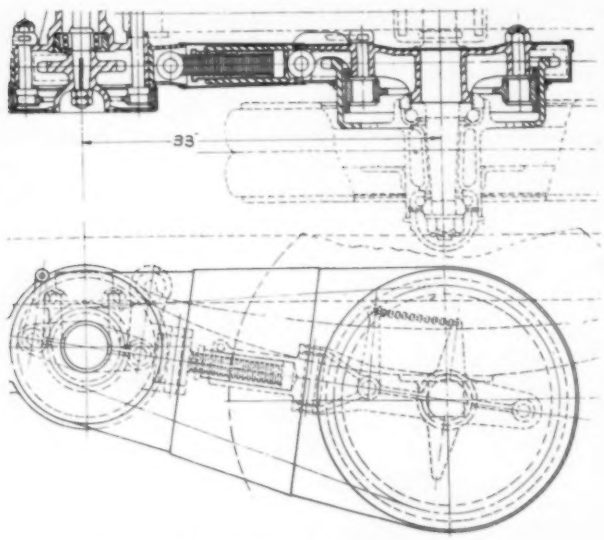


Fig. 5. The Merchant & Evans Chain Case

Here is shown a peculiar type of chain case in which the radius rod is placed inside of the case. The ends of the rod adjustment form the upper and lower ends of the case, while a leather cover forms the center of the case. The ends of the case are made in skeleton castings and form the brake supports at each end, while pressed-steel covers are provided to prevent the dirt and grit from reaching the chains and also retain the oil. The leather cover must be loosened at one end in order to inspect the chains and replenish the oil supply.

line with the front wheel, and places the jack shaft sprockets out of line with the rear wheel sprockets, causing the sprockets and chains to wear rapidly. These facts alone show the necessity of providing suitable adjusting members, which can be graduated so that the most careless driver or mechanic can note the amount taken up after one chain has been set.

Incorporating the radius rod and inner member of case in one, offers some advantage in that the chain and radius rod pivot from one center, i. e., the center of the jack shaft, so that the tension due to spring action is released from the chain. This feature may also be obtained with the individual rod and case. However, its first cost is somewhat higher, while it has the disadvantage of increasing the number of parts requiring attention, adding somewhat to the maintenance. It is also very difficult to obtain a marked micrometer adjustment with the independent case and rod.

Another feature to be found in the combined radius rod and inner chain case member is that marked adjustment is

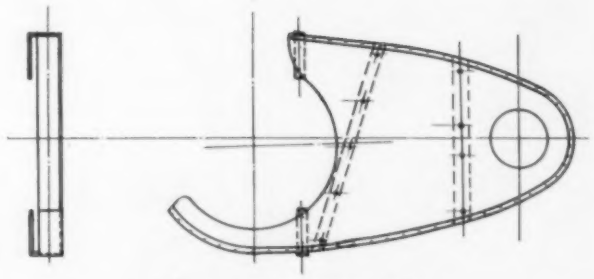


Fig. 6. Barker Chain Drive

This shows a type which is used only as a dust shield, leaving the chain and radius rod very accessible. It merely protects that part of the chain which is in the course of the water and mud thrown off the wheel.

quite simple. In this type the adjusting member is usually in the form of an eccentric, which can be graduated with the case proper so that as little as 1-64 in. or as much as two full chain lengths may be taken up, with the aid of a special spanner wrench usually provided with this type of case, the adjustment being accessible from the outside of the case. Locks are provided which can be quickly released without disturbing the case in any way, making the entire adjustment simple and accessible, a desirable feature in commercial car operation.

This feature is very hard to obtain with the individual rod and case. In fact, it is only found where the radius rod and and inner case member are combined. The number of makers using this construction may be counted on the fingers of one hand, and in all cases the eccentric is used as the adjusting member.

It can be readily understood that the radius rod should pivot in the axial line of the jack shaft sprockets so as to maintain a common arc of travel for the rear wheel about the jack shaft center. However, a large number of trucks may still be seen with the radius rod arm connected to a hanger some 6 or 8 in. from the axial line of the jack shaft sprockets. The rear end should be mounted so as to provide universal movement for the pivoting from a point either in front or the rear of the axle center, on the brake bracket. However, this does not enter into the discussing, as the point of movement is about the axial center of the jack shaft. Pivoting the rod from a hanger not only sets up a tension on the chain, but also causes it to slap in the case and create a dull noise due to the individual centers of spring, rod and chain.

In discussing the advantages of the enclosed chain drive the writer is prompted to compare this method of power transmission with that of the shaft drive bevel, worm or internal gear method. It is generally conceded amongst commercial car engineers that the field of the bevel drive axle is very

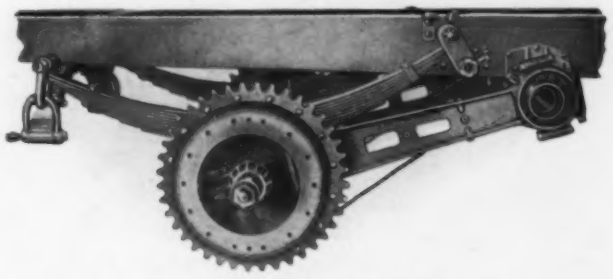


Fig. 7. The Lozier Chain Case

This illustration depicts a design in which a separate radius rod, provided with an eccentric micrometer adjustment, and separate case are used

definite, the limitations being confined to light duty. The final reduction usually desired in commercial cars can not be obtained with bevel gears, owing to the size of gear this would involve. In fact, the only successful bevel gear devices are in combination with the double reduction and internal gear axles. These permit of a double reduction as in chain drive, and reduce the size of gears.

The only advantages of the shaft drive are cleanliness, little noise and the reduction of wear, due to the entire housing of all moving parts. These advantages may equally be obtained in the enclosed chain drive. Engineers generally have avoided the use of the worm drive because of its vastly greater expense and the well-known difficulty in proper mounting of same. It has been incorporated in designs only when large gear ratios were demanded or where conditions compelled its use, while makers in general using the worm drive have not tried to cope with the problem of the replacement of worm and wheel, as well as the bearings outside of their own works. If these are permitted to run the slightest degree out of alignment heating will result, causing the destruction of the remaining bearings or the new ones. This condition has not been met successfully in England, if we can take the Automobile Engineer year book for 1912 as an authority.

The Alden Sampson Manufacturing Company, of Pittsfield, Mass., are the manufacturers of the chain case shown here and in this case gives an excellent idea of the value of enclosed chains.

Another disadvantage of the shaft drive is that the differential is located in the center of the axle, where it is subjected to stress and shocks, which are severe in commercial cars where solid tires are used. In chain-driven cars the differential is located in the most comfortable part of the chassis, where it is more efficient and longer lived, and it is not subjected to vibrations, being protected through the chassis springs. If differentials for shaft and chain drive are compared, it will be found that those designed for the shaft drive are heavier than those of the chain drive. This will bear out the above argument.

The usual argument advanced against the chain case is that the first cost of the case is equal to the cost of a new chain. However, in summing up the advantages and disadvantages of the open and enclosed chain drive, it will suffice to state that the commercial car can only be developed by the introduction of reliability and simplicity into the design. The entire success of the vehicle depends upon its money earning value, and reliability is the first requisite in commercial values

PERTH AMBOY COMPANY INSTALLS WHITE EQUIPMENT

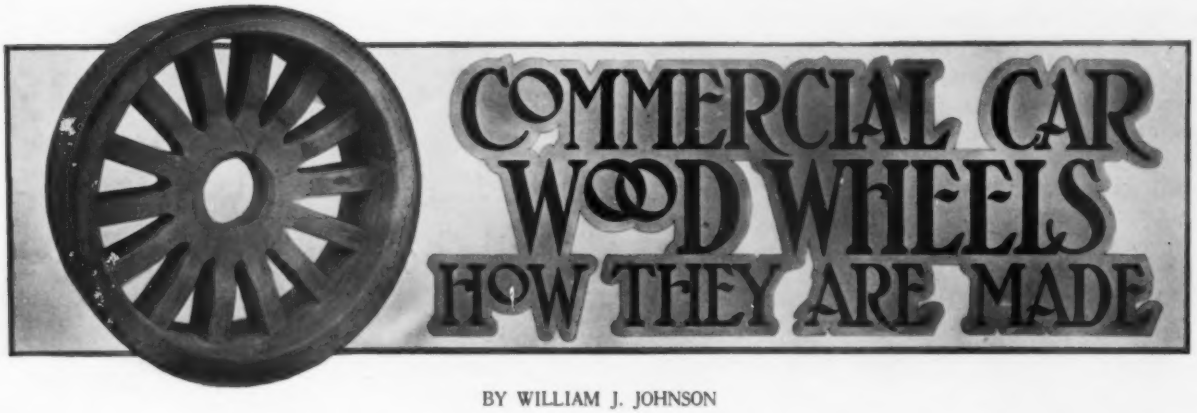
A motor 'bus line was established in Perth Amboy, backed by some of the largest transit interests, as well as individuals who are greatly interested in anything that will facilitate the transfer of out-of-town passengers to stores in the larger cities. The initial line opened by the company is carrying people from Boynton Beach, Sewaren, Port Reading, Chrome and Carteret to Perth Amboy.

A 'Bus Used in Jersey, Equipped With Fittings Which Make it Serviceable for Both Winter and Summer

The chassis of these 'busses are of the 1 1-2 ton class, made by the White Company, of Cleveland. They will seat 18 passengers and driver, and are all of the pay-as-you-enter type. Electric fans cool the cars in summer and a heating system is provided for use in winter. The seats are luxuriously upholstered and the interior of the car is well lighted with electric dome lights. The installation of this motor 'bus line in Perth Amboy will prove a great convenience to the residents, inasmuch as street cars have never been permitted to run on some of the finest streets, nor are there many convenient lines adjacent to them, making it inconvenient for residents to get to and from the shopping district except in their own vehicles.

The company behind the enterprise has ample capital and intends to install more of the White 'busses in the near future for service between other nearby towns in the state.

We are always willing to assist our readers in any manner possible, and if there are any questions you wish to ask, do not fail to write us, as our columns are free for discussion. Ask the Editorial Department of the "C. C. J." and get the desired information.



BY WILLIAM J. JOHNSON

FEW commercial car makers build their own wood wheels; that is left to the wheel builder, who is a specialist. Wood wheel production is rendered positive by the intricate machinery now used. A given operation is repeated time after time with positive results. The wheel industry has been marked by rapid growth, which is consistent with the expansion of the self-propelled vehicle industry.

Selection of Material

Initial effort in wheel production is selection of the raw material. Most of the big wheel builders have mills in the south and buyers are constantly in touch with conditions and usually are aware of the fact that a carload of choice stock is to be had in a certain locality. Hickory is generally used and preferred for spoke stock, though oak is coming in and is said to afford about as good results. One has heard ever so much of the so called "second growth hickory." One maker's representative states that there is not enough second growth hickory in the country to mention, another says the supply will last for twenty years more. But whether or no, the process in wheel production is not affected. Hickory is preferred for spoke stock up to a 2½ in. section, in larger sections oak is said to afford just as good results.

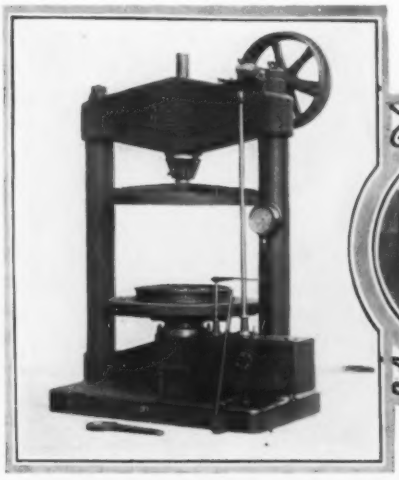
Rock Elm for the Felloe. Source of Material

For felloes rock elm is used and much of this comes from Michigan and Wisconsin, occasionally some is received from the south, and it is regarded as a scarce article. The south is now relied upon for supply of hickory, for instance, such states as Kentucky, Louisiana, Tennessee, Mississippi and West Virginia produce the hickory used by the northern wheel makers.

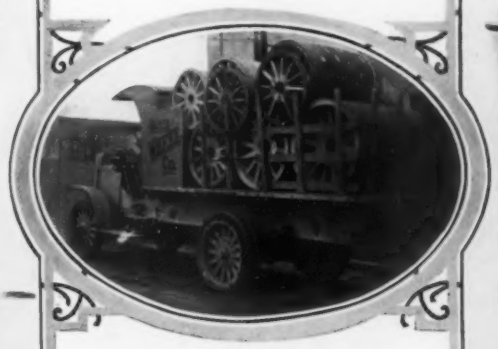
At one time Indiana and Ohio figured in the hickory trade, but in the course of events the supply was exhausted, so the wheel makers state, and while occasionally a car load may be received the supply is said to be undependable. Second growth hickory stock is derived from trees under 20 in. in diameter, according to one wheel maker, above that size the trees are called forrest. Much depends upon the manner in which the raw stock is sawed. The cost of the stock has increased, as it is said the tracts are now more remote from shipping centers than formerly.

Saving the Spoke Stock

In some cases there is received from the southern mills billets or clubs of hickory for spokes. These are sawed to a given length. At the Hayes plant at Jackson, for example, these sawed pieces are received in carload lots and are

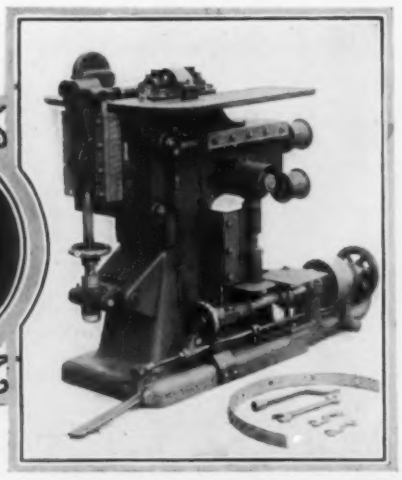


Hydraulic Band-Setting Press; the band is first heated and then placed over the wood felloe of the wheel and gradually pressed to place. This machine works up to sixty tons pressure.



Truck Hauling Commercial Car Wheels

The Hayes Wheel Company, Jackson, Mich., recently purchased a Mais three-ton internal-grear-driven truck, which is used in carriage of completed truck wheels. The car is shown herewith and is said to have greatly improved the delivery system.



Felloe Boring Mchine; boring is done on this machine, the boring tool being driven at high speed. A felloe, drilled ready for the spokes, is shown on the floor.

The illustration shows the Felloe-Bending Machine. The felloe is shown in the steel form after being bent to a semicircular form. It is then removed and seasoned in a drying kiln. The Mitering Machine, which miters or bevels the base of the spokes and trims them to proper size, is also pictured, while the remaining view shows how the spoke billet is placed in this trimming lathe and the rapidly revolving cutters form it to a given design. On the floor are shown four sizes of oval section spokes.

measured and sorted as to size as they are taken from the cars. At some of the other factories the wood comes in longer slabs or clubs and is sawed to a given size as required.

Kiln Drying

Worth of a wood wheel is dependent upon three things: the quality of material, seasoning, and care in working the raw material. Many wooden wheel troubles, such as shrinkage, for instance, are due to improper treatment. It is obvious that seasoning is of prime importance and this process is accomplished in dry kilns. The temperature of the drying kilns is gradually raised until it approaches 150 deg. Fahrenheit. The billets or rough sections of stock are placed in the dryer or kiln and there remain until properly cured.

In the old days when wood was seasoned by the weather, it was the practice to allow a year for one inch stock to season and larger sizes in proportion. But the steam kiln has changed all that.

Spoke Formation

Assuming that spoke stock has been in the steam kiln a sufficient length of time to properly season, the next step is formation of the spoke. This is an interesting, though simple process, and an illustration of machine precision. The rough billet of spoke club is placed in the machine, held rigidly to place and is brought in contact with a series of rapidly revolving knives or cutters. That rough block of wood in the twinkling of an eye, resembles a wheel spoke. The spoke cutters can be arranged to form any type of spoke, rectangular, oval or round shank, with or without bosses through which brake drums are secured. The first process leaves what is termed the "club."

Mitering and Tenoning

The next process is to mitre the spokes, or, in other words, the base or heavy end is beveled off. This is accomplished in little time and the operator mitres the clubs about as fast as he can lay down one and pick up another.

Next the spokes are tenoned, that is, the smaller end is turned down to a smaller diameter so that it may fit in a hole drilled in felloe, the tenoned end forming the anchor, the fit a driving one. The spoke is now finished at both ends and is then sanded or smoothed. An endless sand-coated belt, driven at high speed, is used for the sanding process. In the case of the Schwarz wheel a patent spoke is used, that is, the base of the spokes are grooved and mortised, so that one spoke enters another, or interlocks at the base.

Steaming the Felloes

The rock elm felloe slabs are placed in a steamer and allowed to remain until ready for use. This process renders the wood pliable. The long slabs are held in a steel form. Two massive side arms are caused to rise to the vertical and force the outward ends towards center, thus forming the flat stock to a semi-circle. The form is then locked and the stock allowed to set for about 24 hours. After this the bent felloe strips are removed from the form and placed in the kiln to dry and season, duration of this process varying with the stock. The process requires about three months.

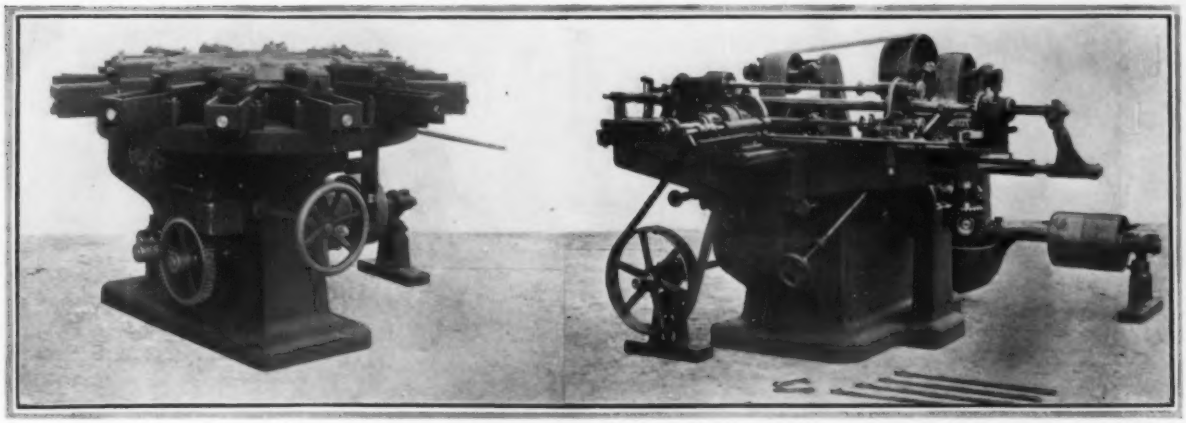
Assembling the Wheel

When the felloe is removed from the kiln it is planed and drilled for the reception of the spokes. The spokes are assembled in the felloe sections by hand, hammered to place. The two sections of the wheel are placed in a massive compressing press and the wheel assembled with a dummy hub. Now the wheel proper is assembled and complete. Next the wheel is trimmed in a lathe, or turned to true round.

Shrinking the Bands. Spokes Compression Members

The next process is to shrink the steel bands. The bands are heated evenly over a charcoal fire and are pressed to place on the wheel by a hydraulic press. The wheel now completely assembled, turned and fitted with the band, is ready for treatment of the center. It is placed in a combination facing and boring lathe, the faces of the spoke bases

In the illustrations are shown the Tenoning Machine, on which the tops of the spokes are turned to a smaller diameter so that they may be driven into the drilled felloe; Equalizing and Turning Machine—set to gauge, trims off the excess stock so that the felloe is cut to the correct size; Facing and Boring Machine—cutter in position against wheel, the boring bar in idle position.



Assembling Press and Spoke Sander

Assembling Press, into which the two sections of the wheels are placed and compressed to shape of dummy hub. The wheel is then ready for the trimming lathe. The Spoke Sanding Machine here shown is a means whereby the spokes are smoothed off, the endless belt, driven at high speed accomplishing this end.

trimmed, the center drilled out and beveled as the case may be. T bolts are driven into the felloes at the intersections, and the wheel is ready for the priming or leading coat.

Spokes of a wheel are compression members, and in the course of travel each takes the direct thrust, and generally speaking this is about all that the spokes are called upon to endure. However, in the case of skidding, a shearing and tension must be withstood. If the spoke stock has not been properly seasoned the defect will soon become apparent.

Professor C. J. Tilden, C. E., of the University of Michigan, has conducted a number of tests with Hayes wheels. One wheel was loaded to the extent of 140,000 lbs., or 70 tons, in a 200,000 lb. Riehle testing machine. The result of the test was a flattening of the steel band at top and bottom, some of the spokes loosened at felloe and hub. The wheel could still be used, though this would hardly be advisable. At any rate this special test showed the strength of the wood wheel.

ECONOMY CLAIMED BY THE USE OF SOLID WOOD WHEELS DURING THE SUMMER

Many users and owners of commercial cars believe tire upkeep to be the largest item in cost of maintenance and in some cases this is true, in others it is not. It depends largely just how a car is used, whether it is equal to the service, whether it is overloaded, the roads traversed, care given the car, and the sort of a man at the wheel must necessarily affect a tire upkeep. Some peculiar ideas are entertained by a lumber concern of Cleveland, using White trucks, as regards tire economy. These are expressed in a solid wood wheel which is shown herewith, this built of laminated slabs of hickory, the tread being the bare wood which wears down in the course of service.

The metal bands with bolts are used to keep the hickory slabs together and make them a rigid mass. When the tread surface wears down to the outer ring, this is taken off and the surface allowed to wear down to the next ring.

The contention of the builders of this type of tire is that, by substituting the wood wheels for the regular rubber fitted to the cast steel wheel during the three hot months of summer, a good economy is effected. When new the wheel weighs 885 lbs., and the hub proper is regulation type adapted to the White wheel pivots or spindles. The tread is about a foot wide and a peculiar feature about it is that, everything with which it comes in contact is lifted and becomes embedded in the surface.

When photographed the wheel surface was studded with bolts, nails, pieces of wire and all sorts of metal street refuse. The faces of the wheel are fitted with steel bands and when the tread wears down to one of these bands it is removed so that the surface may wear down to the next band. The users state that the wood tires work out to their satisfaction and materially reduce tire bills. The makers of the truck, however, do not take kindly to such equipment and tried to discourage the owner at the start, but having the courage of his convictions he tried out the equipment with the result that it will be used again. The garage manager stated that the cars are very noisy and there is much vibration when the wood wheels are used; the brakes too, being called upon to endure severe strains.

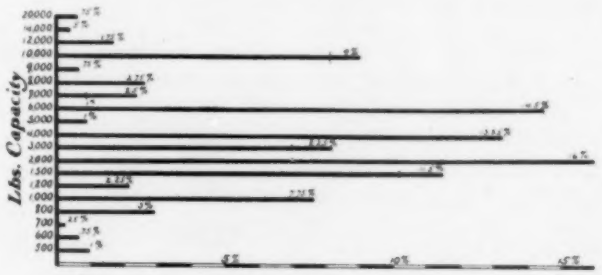
Motor Trucks have replaced the antique horse-drawn vehicles in the postal service at Rochester, N. Y. From the first day's service given by the trucks it was seen that the change was a beneficial one.

The Fire Department, of New Orleans, La., has decided to spend no more money for horse-drawn fire apparatus. Every dollar which is spent in the future, either for repairs or for renewals, will be spent for motor apparatus.

Some Automobile Statistics*

DURING the past six months I have collected in the regular course of my duties considerable automobile data direct from the manufacturers, with a view to ascertaining the general tendencies in design among the makers of commercial cars. Some of these data have been tabulated and put into such form that the changes which are taking place can be readily seen. This includes the complete specifications of practically all of the commercial cars now on the American market by American manufacturers and from it many interesting conclusions can be drawn.

Unfortunately, accurate figures in regard to the actual number of trucks made by each manufacturer cannot be obtained. An attempt was made to get this information, but less than 30 per cent. responded, and the attempt was abandoned. However, the models listed by the various makers give some clue as to which capacity trucks are most popular among the users. From a review of 423 different models, representing 178 makes, it is found that in 1911 more one-ton trucks were



listed by the various makers than any other size, these being represented by 19 per cent. of the total number of models, and second on the list came the three-ton trucks, as represented by 14.5 per cent.; third were the two-ton trucks at 13.5 per cent.; and the 1500-lb. trucks fourth, represented by 10 per cent. In 1912 exactly the same order holds, but the number of one-ton models listed dropped from 19 per cent. to 16 per cent., the number of three-ton models remained exactly the same, 14.5 per cent.; the two-ton models also remained practically the same, while the number of 1500-lb. models listed, increased from 10 per cent. to 11.5 per cent. These percentages are clearly shown on the accompanying chart. It is noticeable that the largest number of models listed are between 1500 lbs. and three tons, the seven, eight and nine thousand lb. trucks dropping to 2½ per cent., the five-ton trucks being the only large capacity machines listed in any number. These are represented by 8 per cent. last year and 9 per cent. this year. This chart might be spoken of as the popularity chart of the makers, as it shows the preference of the makers for these certain sizes. As I said before, it is unfortunate that the exact number of cars of each of these models manufactured could not be obtained, but the preference of the makers is a good index of the public demand.

*Paper by E. S. Foljambe, read before the Philadelphia Branch of the Society of Automobile Engineers.

Truck Weights Increased

Let us now consider the weight of the various models as listed in 1911 and 1912. By reference to the accompanying table we find that there has been a decided increase all along the line in the weight of the cars for 1912, with the one ex-

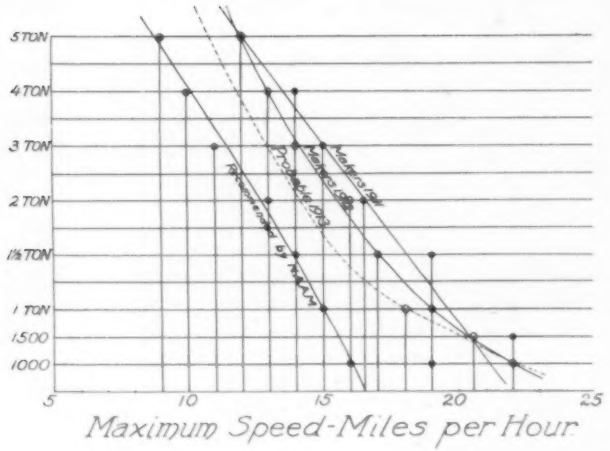
Carrying Capacity	Weight	Price	Rear Overhang	Height of Load Platform	Speed	Under Hood	Under Seat	Tires %		Wheel Base
								Solid	Pneumatic	
1000	1884	961	18	32	19	33	66	75	25	93
	2620	1413	24	31	22	66 6	33 3	72 5	37 5	99
1500	2232	1418	23	34	22	53	47	88 8	11 2	100
	2319	1390	23	33	20 5	69 1	29 9	50	50	107
1 Ton	2650	1655	27	36	19	29 6	70 4	85 3	14 7	105
	2844	1876	30 5	37	18	54 2	45 8	94 7	5 3	112
1½ Tons	3333	2320	30	39	19	50	50	88 8	11 2	115
	3583	2634	30 5	37	17	42 8	57 2	96 5	3 5	116
2 Tons	4013	3000	28	38	16 5	48	52	88	12	125
	4173	2725	34	40	16	54 3	45 7	97 8	2 2	127
3 Tons	5486	3416	41	41	15	41 6	58 4	100	0	129
	5649	3439	45	41	14	42 8	57 2	98 1	1 9	141
4 Tons	6190	4090	27	41	14	71 4	28 6	100	0	142
	6360	3290	52	45	13	40	60	100	0	143
5 Tons	7439	4474	38	43	12	53 3	46 7	100	0	137
	7211	4749	75	42	12	17 4	82 6	100	0	136

ception of the five-ton trucks, thus indicating that in the judgment of the manufacturers, the trucks of 1911 were too light in construction. For example, the 1000-lb. trucks averaged 1884 lbs. in 1911; for 1912 they average 2620 lbs.; the 1500-lb. trucks increased from 2232 to 2319 lbs.; the one-ton trucks from 2650 to 2844 lbs.; the one and a half-ton from 3333 to 3583 lbs.; two-ton from 4013 to 4173 lbs.; three-ton from 5486 to 5649 lbs.; four-ton from 6190 to 6360 lbs.; while the five-ton trucks were reduced in weight from 7439 lbs. in 1911, to 7211 lbs. in 1912. Again referring to this table, we find that in like manner the prices have been increased all along the line, the following being the prices with standard bodies. The only exceptions to this increase is a reduction of $300 in the average price of two-ton trucks, and of $700 on the four-ton trucks; the 1500 lb., one and a half-ton, one-ton, three and five-ton models being higher priced.

The rear overhang, or distance from the center of the rear axle to the end of the body, has also been increased, the figures given being in inches. The largest increase is on the heavy trucks, such as the four and five-ton models. The average overhang on the five-ton machines for 1911 was 38 in., while for 1912 it has been increased to 75 in. The height of the loading platform remains about the same, and ranges between 31 in. on the 1000-lb. machines and 45 in. on the four-ton trucks.

The Average Speed of Trucks

In connection with the speed of the various sized trucks, the data brings out some interesting points. From the figures given on table No. 1, curves of the speed of the 1911 trucks and the 1912 models have been plotted and are compared with the curve of speeds plotted from the figures recommended by the N. A. A. M. These are the speeds which the manufacturers claim for their different models. It will be seen at a glance that the makers advocated a speed much higher in 1911 than in 1912. The speed of all the models between 1500 lbs., and four tons has been lowered, while for 1912 the



speed of the smaller trucks is even higher than in 1911, with the speed of the five-ton trucks almost the same. All of these speeds it will also be seen are very much higher than recommended by the N. A. A. M., so that it is safe to predict the curve for 1913 will be somewhere between that of 1912 and that of the N. A. A. M., in other words, there should be considerable reduction in the speed as recommended by the makers for 1913. This curve, if we may be allowed to forecast, will in all probability show its greatest reduction in connection with one to four-ton models, and will probably be somewhat as suggested by the dotted curve. I do not believe the speed of the 1000 to 1500 lb. trucks will be reduced; in fact, I shall not be surprised in the least to see an increase in the speed of these sizes. This increase will be due to the increase in the use of pneumatic tires on cars of this size, thereby permitting increased speed without detriment to the mechanism.

Use of Pneumatic Tires on Trucks

In this connection the figures on tires are enlightening. Again referring to table No. 1 on tires, we find that in the 1500-lb. models there has been a decided increase in the number of those fitted with pneumatic tires, while in practically all of the sizes above this there has been a decrease in the use of pneumatics. This might be interpreted, that last year a large number of cars were fitted with pneumatics by the makers who found that this did not pay on any but the smaller sizes. For instance, on the one-ton cars the percentage of the models fitted with pneumatics dropped from 14.7 in 1911 to 5.3 per cent. this year; on the one and a half-ton trucks from 11.2 to 3.5 per cent.; on the two-ton trucks from 12 to 2.2 per cent.; on the three-ton trucks the per cent. increased this year, but the increase was due to some makers who were putting out fire apparatus fitted with pneumatics. There are practically no machines put out regularly over two tons, now fitted with pneumatic tires. In the smaller models we find an increase from 25 per cent. in 1911 on the 1000-lb. wagons, to 37.5 per cent. in 1912; and a surprising increase of from 11.2 to 50 per cent. on the 1500-lb. wagons.

Investigating Pneumatic Tires on Heavy Trucks

That investigations are, however, now being made to determine the feasibility of special pneumatic tires on heavy trucks is well known. I have found several instances of heavy trucks on pneumatics where speed was an essential item; for example, in New York City one of the Union Railway Company's street railway tower wagons for use in repairing the trolley wires, was fitted with single pneumatics in front, and twins on the rear, these tires all being the same size, 37 x 5 in. This truck was of three tons capacity, and carried a load of two tons, including the equipment and men. A speed of twenty miles an hour was easily maintained. In one hundred and ten days the truck covered 1990 miles, at the end of which time the shoes were in excellent condition, which is a pretty good showing considering that the truck is driven largely over cobblestone pavements and in the car tracks. Morgan & Wright are experimenting at Detroit with their new 38 x 8 in. nobby tread pneumatic tires on three G. M. C. trucks of three and a half tons capacity. The weight of these trucks is 8000 lbs., and they have been loading them with from three to five tons of freight, and have been driving them continuously over the worst pavements they can find, at speeds from fifteen to eighteen miles per hour. It is claimed these loaded trucks ride like touring cars, but the result of the experiment as to tire bills has not yet been announced. The new Packard public safety wagons of the Detroit police department are fitted with 7-in. pneumatics on the rear. I do not know the weight of these machines, but they are heavy and driven at high speed. After five thousand miles the tires are reported in good condition. Fire apparatus, weighing with load 10,000 lbs., and capable of forty miles an hour, has been repeatedly tried, but, of course, owing to the long periods of rest, probably with the weight of the car off the tires, this is no criterion by which to judge pneumatic tire performances on ordinary commercial cars. Nevertheless, these experiments show which way the wind blows, and it is safe to say that at least for the smaller models, and possibly an occasional three-ton car, pneumatic tires will be developed and used where speed is of sufficient importance to warrant the expense. It must be borne in mind also, that the general up-keep of the truck has been found in nearly every one of these experiments to be less, owing to the use of pneumatics, even if the speed at which the car was driven greatly exceeded that at which it was driven on solids, so for cars up to two tons it may reasonably be expected the tire makers will develop something in the form of a pneumatic which will allow higher speeds than those recommended by the N. A. A. M., and as now suggested by the makers. I say suggested by the makers, because it is well known that the users do not hold themselves down to these

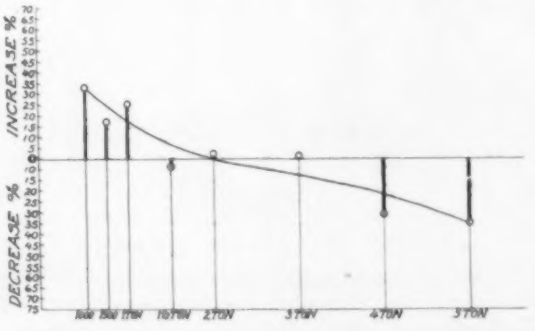


Diagram showing percentage of increase or decrease from 1911 to 1912 of models with motor under the hood

suggestions, and there are plenty of instances of 1500-lb. trucks being driven thirty miles an hour. Needless to say they do not last long.

Engine Location

The location of the engine is still a mooted question, foreign practice favoring a position under the hood, while American practice has favored a position under the seat or floor boards. I say, has favored, for the percentages show that there has been a decrease in the under-the-seat location of the motor, on all the smaller capacity machines, these including everything up to one ton. On the one and a half to three-ton models there has been practically no change, while on the four and five-ton trucks there has been a decided increase in the under-the-seat location. Reference to table No. 1 shows that this position has increased on the four-ton trucks from 28.6 to 60 per cent., and on the five-ton trucks from 46.7 to 82.6 per cent. The increase in these larger models, of the under-the-seat position, is just as decided as the decrease in this position of the motor is, on the smaller models. Under the hood designs have correspondingly increased in the 1500 and one-ton trucks. The intermediate sizes, one and a half ton to three tons, have changed very little, while on the large sizes, as represented by the four and five-ton models, there has been a decided decrease in the number of models listed with engines under the hood. These changes are clearly shown by the curves.

		1911	1912
CLUTCH	BAND	6.3 %	3.1 %
	CONE	35.1	37.3
	DISC	51.3	59.4
EQUIPPED WITH ENGINE STARTERS		—	5.4
DRIVE	CHAIN	80.9 } 84	63.2 } 67.7
	FRICTION	3.1 }	4.5 }
	SHAFT	16	21.7 }
	SPUR	—	6.6 } 32.5
	WORM	—	4.2 }
STEERING WHEEL	RIGHT	82.6	78.
	LEFT	17.4	22.
BRAKE and CHANGE GEAR LEVERS	RIGHT	—	70.6
	LEFT	—	8.8
	CENTER	—	20.6

Disc Type Clutch Most Popular

It may also be interesting to note which type of clutch is gaining. From table No. 2 it is seen that the disc clutches are very largely in the majority and are increasing, these being represented by 51.3 per cent. in 1911, and 59.4 per cent. in 1912, or practically 60 per cent. of the clutches for this year being of disc type. Cone clutches come second with 35.1 per cent. for 1911, and 37.3 per cent. for 1912, a very slight increase. Contracting and expanding band clutches and other types of band clutches were represented in 1911 by 6.3 per cent., and have dropped to 3.1 per cent. for 1912.

The 1911 data did not include equipment of self-starters, so I have no figures. This year 5.4 per cent. of the commercial cars are equipped with self-starters, and it is safe to predict this figure will be increased steadily from year to year. There is no question but that a commercial car should be fitted with some sort of engine starter. Such vehicles are standing it is variously estimated from 60 to 70 per cent. of the time, and in the majority of cases the operators allow the engines to run idle. The gasoline consumed does not amount to much at any one stop, but in a year's time is considerable, as is also the needless wear on the engine.

Chain vs. Shaft Drive

The question of the proper final drive for trucks is also one which has been much discussed, both among engineers and in the trade papers. In the pleasure car field we have noticed the almost complete disappearance of the side chain drive in this country. In the commercial car field there is a similar tendency, although owing to the large reduction necessary, side chains will probably never be as completely displaced as in the pleasure car construction. In the figures given in table No. 2, friction drives are included with the chain drives, as practically all of the friction transmissions transmit their power to the rear axle through a chain or chains. Last year chains were represented by 84 per cent., the shaft drives by 16 per cent. This year chains are listed on 67.7 per cent. of the models, quite a noticeable decrease, and shaft drives, which include the ordinary bevel gear, spur gear, and worm constructions, are represented by 32.5 per cent. It may be of interest to note that worm gear drives are represented by 4.2 per cent., there being nine makers among the gasoline car manufacturers listing models with this type of drive. These makers are Blair, Dain, Franklin, Marathon, Pierce-Arrow, Rowe, Smith, Stegman and Sternberg.

In regard to the steering wheel location, a decrease in the right side position is noticed, and a corresponding increase in the left side. The new center location of the brake and change speed gear levers so noticeable in pleasure car design this year, is also invading the commercial car field, the center position being already represented by 20.6 per cent.

It is my intention to ascertain these figures each year, and by keeping such records show by charts or otherwise the changes in design.

G. M. C. TRUCK HORSE AMBULANCE

"Civic societies other than the S. P. C. A. are taking an active interest in alleviating the suffering of horses. A wealthy woman of Detroit, through the Twentieth Century Club, has presented to the city a G. M. C. Truck, to be used as a horse ambulance. This is to be patterned after the one recently purchased by the city of New Orleans. It is to have all the devices for making animals comfortable while en route, and will be provided with a mechanically operated floor, facilitating the depositing and removal of the horse."

Profit by the failure of others. Read the C. C. J. and learn how others have solved the transportation problem more economically, rapidly and satisfactorily by means of the truck. Every issue contains information which is worth money to the man who is using commercial vehicles.

Commercial Cars That Are Being Used in Road Construction and Maintenance Work

The Horse Fast Giving Way to More Modern Apparatus in Road Construction, Repairing, Cleaning and Sprinkling

ROAD construction is another of the many industries in which the commercial car is rapidly supplanting the horse. This innovation is by no means recent, but has been going steadily along for years. In days gone by the heavy rollers for packing down the road surface materials used to be drawn either by six or eight horses or by a large gang of laborers. This method was supplanted by the steam roller, which has held its own against all other forms of roller. It is very doubtful whether either gasoline or electricity will ever take the place of steam in this respect for many reasons. For one thing, the roller must go slowly in order that the weight of the vehicle may have time to take effect on the material which is being packed down. For this speed of 2 or 3 m. p. h. steam is almost ideal, as it gives the power without the use of gear reduction. This one phase of the problem then seems to have been solved in a satisfactory way, and there is no doubt in anyone's mind as to the relative efficiency of the steam roller and a roller drawn by horses or men.

Another very important factor in road building, however, seems to have been overlooked until recently, and that factor is the hauling of road building materials. Horses were, and are still, for that matter, used to a great extent for this purpose, and one of the commonest sights on our streets today is the two-horse team pulling a "dump-wagon," with its dusky driver under a large umbrella "in the arms of Morpheus." The expense of keeping a large force of such teams going has been recognized as one of the contractor's drawbacks, and now that commercial car chasses have reached a degree of perfection and standardization which warrants their use in many lines of endeavor hitherto impossible, the makers are evolving special bodies which will do the work formerly done by the horse teams quicker and more economically. It will only be a matter of a short time when the contractors, who have not already done so, will either use commercial cars exclusively or will retain only such horse teams as are necessary for short hauling.

Gramm Stone Dumping Car

Gramm three-ton truck with stone dumping body used in road building. The car is run alongside the desired chute and can be rapidly loaded. The floor of the body is hinged and can be dropped by means of the chains and windlass operated by the hand wheel back of the driver's seat. This truck will hold from two to three times the quantity of stone hauled by the horse-drawn vehicle.

Hauling Road Materials

A number of types of bodies have been evolved for use in rapidly loading and unloading stone, asphalt, and other road building and surfacing materials. In the June issue of

Peerless Four-Ton Car

This type of body is one that slides on rollers and then dumps to the rear of the car. The view to the right shows another type, also made by the Peerless Company, which simply raises the front of the body without sliding

International Car, With Dumping Body

This seven-ton Mack truck has a dumping body which deposits the load in the rear. The material is loaded into the truck by means of chutes

the COMMERCIAL CAR JOURNAL we showed an illustration of a car made by the Longest Brothers Company, which had four separate compartments that could be dumped individually. This truck was especially designed for road building work, but could also be used for other purposes.

We show an illustration of a Gramm three-ton truck which is arranged somewhat differently for dumping the load underneath the truck instead of to one side, as in the case of the Longest truck.

The White Company also makes a line of dumping bodies which dump the load on either one side or the other as desired.

A Mack truck of seven-ton capacity is shown herewith being loaded with broken stone. The stone is dumped in the rear of the truck instead of to one side or underneath the truck as mentioned previously. It is well to note that in nearly all cases where commercial cars are used which are equipped with dumping bodies, that there is also a quick method of loading truck use. This shows that the contractors are awake to the fact that in order to make the commercial car economical it must be kept on the go all the time. and slow loading or unloading diminishes the savings caused by its use.

The Shaughnessy Construction Company, of Albany, N. Y., use a Peerless with a sliding dumping body. The Peerless Company also makes another type of dumping body, the dumping operation being effected by means of a nut screw arrangement actuated by a hand wheel, said mechanism elevating the front of the truck.

Still another firm featuring a dumping truck is the Packard Motor Car Company, one of its cars being shown having deposited a load of brick to the rear of the car. The kind

Packard, With Tilting Body

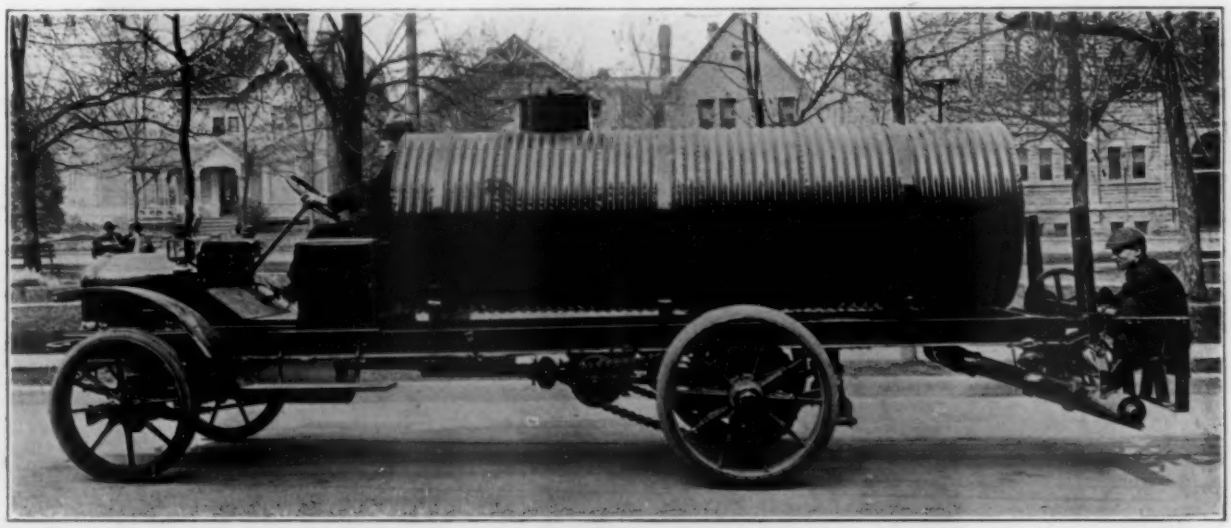
Packard truck which has a sliding dumping body, the load being deposited in the rear as shown. This particular truck is used for hauling brick. The dumping is effected by means of a hand wheel directly in the rear of the driver's seat.

of roads that the truck negotiates is well illustrated in this photograph, the truck showing evidences of soft and mushy road beds.

The Avery Company feature a steel wheel truck, which is especially adapted for hauling trailers.

Cars Used For Hauling Liquids

There are several types of commercial cars used by contractors for hauling liquids and they might be divided into two large classes, those which sprinkle the liquid by gravity



White Sprinkler

White chassis, having a corrugated tank mounted upon it. The entire control of the sprinkling is from the rear of the car, thus requiring one man to be in the back, and one man in front to drive the car. The liquid flows out by gravity without the use of a pump

Knox Road Oiler

The Knox Automobile Company makes a special design of oil sprayer for road work. This truck is equipped with a twelve hundred gallon tank and has a powerful circulating pump, driven from the transmission shaft. Control of the sprinkler is from the driver's seat.

for laying the dust and those which carry heavier liquids necessitating pressure of some kind to force the liquid out. In this latter class are included carriers of asphaltum, oil and other heavy liquids.

The Gramm truck which is shown herewith is equipped with a three cylinder Deming dump which creates the pressure for forcing liquid from the jets. Four of this type of truck are used by Guernsey & Kinkade, near Seattle, Wash. One is also used by the city of Pawtucket, R. I., for oiling macadamized roads. This truck is the regular three ton capacity and the tank has a capacity of 600 gals.

Gramm Tank Car

Gramm three-ton chassis surmounted by a six hundred gallon tank. A three-cylinder pump is used to supply pressure for forcing the liquid from the tank

Owen Truck With Grader

Here is shown an Owen Truck, model H, express body, manufactured by R. M. Owen and Company, Lansing, Mich., to which is connected a Gillespie Good Roads Grader. As seen in cut this grader is attached to rear of truck, and so pulled along the road. The three scrapers are said to be very effective, being built in three sections, thus conforming to roadbed.

The county of Multnomah, Ore., uses a White three ton chassis which has mounted on it a tank of corrugated construction. On this outfit gravity is used for dispersing the liquid, no pumping being necessary. The control of the flow and of the height of the liquid disperser are from the rear of the truck as shown.

Trucks Used For Grading

Almost any standard truck can be used to pull grading machines, the machines usually being separate from the truck. We show an Avery truck doing such work on a country road. It is quite probable that grading machines will be continued as separate vehicles for the reason that no standard form can be adopted which would be adaptable to all different kinds of roads, each different type requiring a different type of grader.

Avery Towing a Grader

This Avery tows the road grader shown, the steel prongs on the rear wheels being especially adaptable for this kind of work

Novel Body on White Truck

A Body Employing Many New and Useful Features in Loading Convenience

BY OUR WESTERN CORRESPONDENT

The Heineman, Pearson Company, motor car engineers of San Francisco, have evolved a body design for a White three ton chassis that embodies many features desirable and necessary in the quick delivery of sacked coal.

J. Mullany & Company, prominent local coal dealers, are the first to use this Heineman-Pearson product, and they are enthusiastic in their praise of its many advantages. Many other dealers in coal are investigating the maker's claims and prospective users are daily becoming convinced that the ideal coal delivery vehicle has at last been designed.

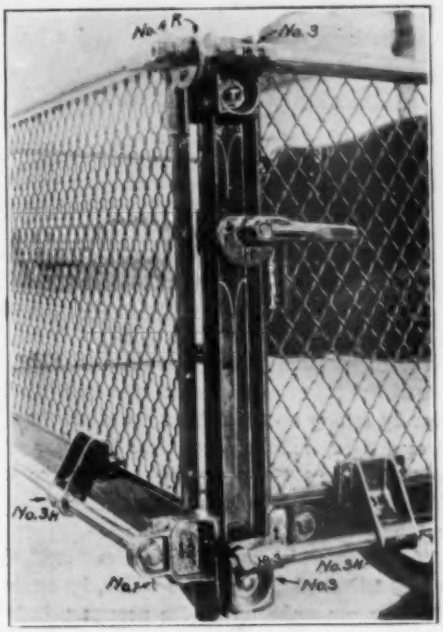
The Heineman-Pearson design meets the following requirements; the body is as low as possible in order to facilitate the loading and unloading of sacked coal; it is so constructed that orders of a few sacks may be segregated, so that orders of any of several sorts of coal can be reached and unloaded without the delay incident to first moving them; finally, the body is of such a pleasing and uncommon appearance that its advertising value can easily be appreciated.

It was the determination of the designers to make the floor height as near as possible to the height of the chassis frame top, thus giving every advantage to the coal handler in loading and unloading. By a complete departure from conventional methods of body design, the floor was brought within 1 7-8 in. of the top frame line.

By arrangements which are shown in the cuts herewith, the features of accessibility and load segregation were attained through the use of five gates. The use of such a large number of gates gave promise of a terrific rattling when the wagon was in motion, if the usual method of latching doors was used, but the set of fittings shown was devised and has resulted in an absolutely noiseless body.

The Stake Sockets, No. 1, the Hinge Parts, Nos. 3 and 3H, and the Latches, Nos. 4R and 4L are shown in the cuts.

The Stake Socket, No. 1 is made to take stakes of 3 in. beam. These stakes are slotted at the lower end and set down over the bolt through No. 3, which acts both as a retaining cap for the stake and as a carrier for the hinge rod, or which the hinge proper No. 3H is fixed.



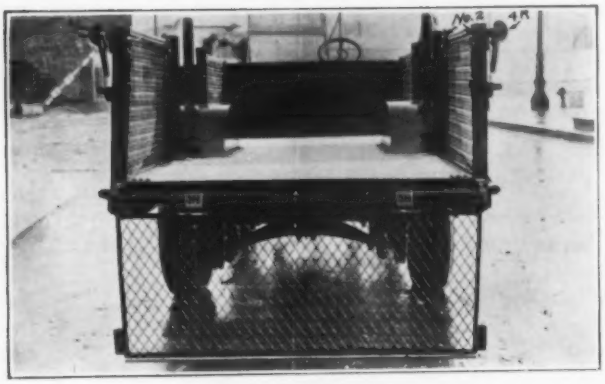
Means for Retaining Gates

This cut shows the stake sockets, the hinge parts and the latches; all of which are used to retain the gates in place and permit of take-up due to wear, and also eliminate rattling.

On the sides of the body all the holes through the Stake Sockets No. 1 are used to bolt to the body, except the last

Truck Body Especially Adapted for Carrying Coal in Sacks

The Heineman, Pearson Company new design of coal truck body, now in use by J. Mullany and Company, of San Francisco, Cal. This body is placed on a three-ton White chassis and is accessible by five doors. A unique feature of this type is the direct placement of the body on the chassis frame



Rear View of Coal Truck

This view shows the tailgate down, leaving the latches exposed to sight. The wheel guards can here be seen, which are of such construction because of the low set body, and are strong enough to sustain the weight of the coal sacks.

one, which is so situated that it can be used to carry the rear door hinge rod.

The side doors are latched as shown and the rear door latch is composed of the No. 3 piece with a bolt on which is carried the rear door latch 4R or 4L as the case may be. These latches are of the screw compression type and can be taken up for wear by setting up the nuts or the studs they turn on. This insures a tight, noiseless door, free from jar and rattle at all times. The part No. 3 may be fixed at the stake top with the bore hole through its lug in a vertical position when it becomes a top iron socket.

The four pieces, which are all of mild cast steel, thus constitute a set of universal fittings from which, by combinations, the body builder can make up all the necessary body fittings for any style of body.

THE EGYPTIAN GASOLINE MIXER

The illustration shows a device just being called to the attention of commercial car users as a means of reducing gasoline bills and increasing the mileage of a car. The manufacturers claim that with the use of this mixer a commercial car which ordinarily runs 30 miles to 10 gallons of gasoline, will do the same distance on 8 gallons under exactly the same conditions. This mixer is placed in the intake manifold directly ahead of the carburetor. The blades or fins extending from the outer walls of the mixer toward the center set on an angle leaving a small opening in the center. When the air and gasoline from the carburetor strike the mixer, the air and gasoline is forced to revolve, forming what is known as a whirl or vortex. Being divided by the fins or flanges of the mixer into separate parts, the individuality of these parts is maintained and the mixture is throttled churned so that condensation of gasoline on the walls is eliminated. With the use of this mixer the car can be thoroughly very low, and the deposit of carbon in the cylinder is also greatly reduced. This mixer is made by the R. D. Loose Mixing Chamber Company, of 110 1-2 North Fifth Street, Springfield, Ill. It lists at $3, any size from ¾ in. up to inclusive 2 in.

The Egyptian Gasoline Mixer

To save time is to lengthen life—use trucks

GAS TRUCK USED FOR SHORT HAULS

Beecher, Peck & Lewis, wholesale paper dealers, at Detroit, Mich., purchased a one-ton Federal, four-cylinder truck, with the idea of effecting economy of delivery costs. According to a member of the firm expectations have been fully realized.

A feature of this service is that the cars are worked to good advantage within a mile from the base. Nine times out of ten truck owners state that cars are all right three miles out, sometimes two. Loads carried average 3000 lbs., and this is not reduced until at least a mile has been covered. Horses used before the installation of the truck, cost the firm ten dollars a day, and an outfit of similar capacity could only do one-half the work. The horse vehicles, for instance, would require a whole day for trip that is covered twice in the same time by the cars.

This truck reduced the delivery costs

It is estimated that cost of operation and the like is a little more than $6 a day. The following figures set forth just how the estimate is arrived at:

Interest on investment of $1950 at 6 per cent.	$9.75
Depreciation at 15 per cent.	24.38
Tires, repairs, etc., fuel and oil, insurance	47.90
Garaging	20.00
Driver	60.00
Total monthly cost	162.03
Cost per day, 26 days to the month	6.23

The cars each travel 1121 miles per month, or about 43 miles per day.

Anheuser-Busch Truck Equipped With Firestone Tires

IT'S their economy for extra mileage, extra traction and car protection, that explains the universal choice of

Firestone Truck Tires

For Every Road, Load and Condition of Service

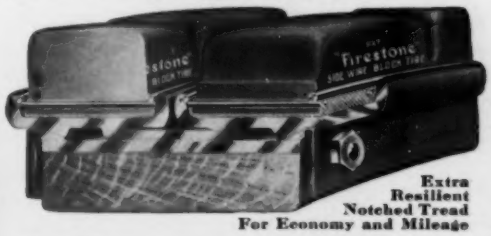
The Anheuser-Busch Brewing Company, as well as foremost truck owners everywhere, have proved their worth, and use Firestone Tires for every style of vehicle.

Resiliency, absorbing all vibration—design to fit every need—quality of rubber, of workmanship, of inspection—all enter in supreme form, into the building, to give their supreme load results.

Specify Firestone Tires for ease and continuous service.

Most Miles Per Dollar of Cost

Hard Base, Channel Type for Heavy Service.



Extra Resilient Notched Tread For Economy and Mileage

The Firestone Tire & Rubber Co.

"America's Largest Exclusive Tire and Rim Makers"

Service Stations Everywhere Akron, Ohio

Most Miles Per Gallon of Gasoline

Hard Base, European Type for Heavy Service

Determining Chain Lengths by the Chain Linometer

IN a chain drive, the usual method of determining the chain length when the pitch, P, the center distance, D, and the number of teeth, N and n, on the two sprockets are known, is as follows:

(1) Find the pitch radii, R and r, of the two sprockets by reference to the tables of sprocket dimensions.

(2) Find the angle d from the formula

$$\text{Sin d equals } \frac{R-r}{D}$$

(3) Chain length equals

$$\frac{PN\,(90°+d)}{180}+\frac{PN\,(90°-d)}{180}+2\,D\cos d$$

Where this operation has to be repeated many times a day, the time consumed is considerable. We illustrate herewith (Fig. 1) an instrument designed and used by the Diamond Chain & Manufacturing Company, Indianapolis, Ind., by which chain lengths can be quickly determined by making three simple adjustments.

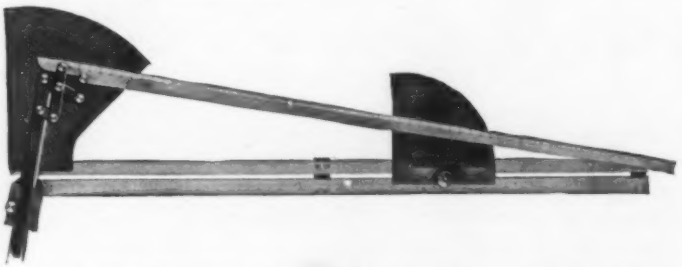


Fig. 1. Chain Linometer: designed and used by the Diamond Chain and Manufacturing Company, for determining chain lengths by making three simple adjustments.

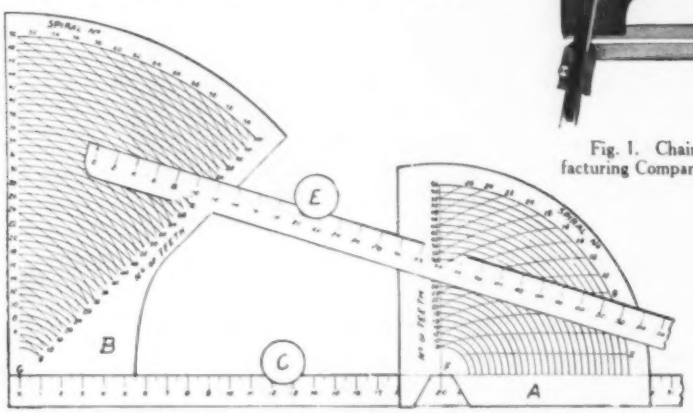


Fig. 2. Diamond Chain Linometer in its Simplest and Cheapest Form; where the parts are made of paper

The instrument in its simplest and cheapest form is shown in Fig. 2, where the parts are made of paper. The fixed scale C is laid off in half-inch divisions, each representing a distance equal to the pitch of the chain. On the movable scale E, each half-inch division represents a distance equal to two pitches—one for the upper half of the chain, and one for the lower half. The circles on the sectors A and B are the pitch circles of 1 in. pitch sprockets drawn half size. Points on the spirals are found by stepping off ½ in. chords on each of the pitch circles beginning at the horizontal radius to the left of C and to the right of F. Through all points one step removed from the horizontal radius, a curve is drawn and marked No. 2. Through all points two steps removed, a curve is drawn and marked No. 4, and so on. The number of any spiral represents the number of chain links from the point where it crosses a given circle to the corresponding point on the lower half of the circle.

As an example in the use of the instrument, let the distance between the sprocket centers be 15 in., the pitch ¾ in., and the number of teeth on the large and small sprockets, 72 and 36 respectively. Divide the center distance by the pitch. The result is 20, which is the center distance in terms of the pitch. Set the sector A at this figure on the scale C.

Now find the pitch circles on A and B corresponding to 36 and 72 teeth respectively. Place the straight-edge E approximately tangent to these two pitch circles, and, noting the points where the spirals cross these pitch circles, shift the straight-edge E so that it covers all but one of these points. See that the zero point on the scale coincides with the point not covered on the left hand dial, and that the point not covered on the right hand dial just touches the straight-edge.

In other words, place the straight-edge in the position that the center line of the chain would occupy in passing from one sprocket to the other.

Take the straight-edge reading, 38, which is twice the number of links in the span of free chain. The number marked on the spiral passing through the zero point is 44. The number marked on the spiral passing through the right-hand reading is 14. The sum of these three numbers is 96, which is the chain length in terms of the pitch. 96 x ¾ in. equals 72 in., which is the chain length in inches.

As the length of a roller chain must in general be a multiple of twice the pitch, the reading on the straight-edge E must be an even number. If then the spiral does not pass exactly through one of the even numbered scale divisions, the next higher even number must be used. If an offset connecting link is used, this number must be odd. If the chain is of the "block" type, the reading may be either even or odd, since the chain length can be any multiple of the pitch.

In the steel instrument shown in Fig. 1, the adjustments are greatly facilitated. The right hand sector is quickly clamped in position by a thumb screw, H; the zero point of the straight-edge is brought to the proper pitch circle by the slide J, which is graduated on the left for roller chains and on the right for block and twin roller chains. The link-work at K allows the straight-edge to swing about its zero point, while the latter is open to view.

If it is desired to determine a center distance such that there will be no "slack" in the chain, shift the right hand sector A until one of the regular divisions of the straight-edge is on a spiral. Then take the center distance reading and multiply by the pitch. To determine this distance by calculation would be a long and laborious task.

To find the length of a belt a special set of sectors must be used. Set the dial plate A to the exact center distance. Set the zero point of the straight-edge on the pulley circle whose diameter is marked on the dial plate itself. Place the straight-edge exactly tangent to the two pulley circles, and take the exact scale reading from one point of contact to the other. If either point of contact is not on one of the spirals, take the number of the spiral that would pass through the point, if it were drawn. This can be readily estimated by the eye. If the given center distance or pulley diameters are not found on the instrument, determine the belt length for half the center distance, and half the pulley diameters, and then multiply the result by two.

To find the length of a crossed belt, proceed as though the diameter of the left hand pulley were equal to the sum of the two diameters, and the diameter of the right hand pulley were equal to zero.

THE RELATION OF THE MOTOR TRUCK DRIVER TO THE TRUCK

Every newspaper or magazine which you may pick up today has at least one article concerning the use of commercial motor vehicles, showing that this subject has become of general interest to all lines of trade throughout the country. From statistics compiled in all of the large cities it is evident that it will be a matter of only a short time when the commercial truck supersedes the use of horse drawn trucks in everything. As proof of this statement, the figures of the manufacturers of trucks show that during the year of 1912 there will be built more trucks than are already in use.

The main question, of course, which has entered into the substitution of motors for horses, has been the relative cost. Trucks have now been in general use for the past eight or ten years, which gives ample time for comparison and the actual cost per ton mile, including depreciation, insurance, etc., on the truck, has always been in favor of the motor-drawn vehicles. In fact, I have known of many instances where the motor truck has saved its owners from 40 per cent. to 50 per cent., in some cases more, over the horse-drawn truck.

One of the features of vital importance for the users of commercial motor trucks to consider is, into whose hands they place the driving and care of their trucks. When you stop to think that every locomotive in use by railroads goes into the round house for careful inspection by experts after every trip of from 150 to 300 miles and then take into consideration that these locomotives run on smooth, even rails; while a truck has to stand the strain of twists and jars caused by unevenness of the roads and the bumping over car tracks, it is evident that to a large measure the success of the commercial motor vehicle, both as to the service and the cost, depends greatly upon the driver. It requires a man who has something besides a vacant stare on his shoulders.

To help insure the best service possible from motor trucks, every dealer should have an Inspection Department whose duty it is to call upon the users of their trucks at least once a month and go carefully over the truck, making sure that everything is in the proper adjustment. Further than this, the inspector makes a trip with the driver on his daily rounds, noting the manner in which the truck is handled as well as the conditions under which it is operated, giving such suggestions to the driver as to materially aid in the service rendered by the truck. But this inspection does not in any way lessen the responsibility of the driver himself. Just as the locomotive engineer at every stop carefully inspects and oils his engine, so should the truck driver carefully inspect and oil his truck every day. There always comes with a truck an instruction book telling exactly what parts need lubrication daily, weekly and monthly. Besides the lubrication, all the essential working parts, such as the brakes, chains, etc., and the bolts, nuts, rods, etc., on which comes the greatest strains should have the attention of the driver every morning before the truck is put into commission for the day. So it is necessary that a driver should not only be competent to handle his truck with judgment under all road conditions, but also he should be endowed with what might be termed "mechanical instinct" and his value to the owner is greatly enhanced if he has had some mechanical experience as well.

In conclusion I would like to call the attention of all users of commercial motor vehicles to the fact that the motor truck replaces from three to six teams of horses, thereby doing away with the services of several men and thus bringing about a certain amount of saving in wages. For this reason alone the owner could afford to pay competent men to handle his trucks, but further a competent driver will obtain so much better service from his truck as so much lower running expense that in the long run he is really the cheaper.

C. Arthur Benjamin.

MOST SATISFACTORY FOR THEIR WORK

"It is most satisfactory for our particular work," is the expression of John J. Bagley & Company, of Detroit, with reference to a 1000 lb. Sampson delivery wagon. "We use it for delivery of packages about the city and for shopping. It has saved us money."

Average daily travel is 30 to 35 miles, and about 6½ gallons of gasoline are used. The driver is paid $2.50 per day, and storage at garage costs $12 per month. The ninth new tire is now in service. Ten per cent. was charged off at purchase, 10 per cent. more at the end of the first year, the car has been in use a little more than a year, and at the end of the second year 25 per cent. will be charged off, making a total of 45 per cent. in two years. The company is loud in its commendation of the manner in which the factory has watched the car and given service.

FEDERAL ARMY TRUCK

The Federal army truck has again made one of its cross country runs, from Detroit to Ludington, a distance of 235 miles. The truck was loaded to its capacity with tents, poles and general supplies and made Lansing the first day, Muskegon the second and Ludington the third. The truck encountered many bad roads carrying its load up hills that would have impeded teams and in some instances it was obliged to ford streams.

MOTOR CAR DELIVERY IMPERATIVE

Horses Cannot Do the Work in Hardware Trade

BY H. B. COLEMAN

Commercial car delivery is imperative, is the only system, and so far in advance of anything else, that there is no comparison, is the statement made by H. B. Coleman, General Manager of the hardware business of T. B. Rayl Company, Detroit, Mich. This statement was made after experience with both horses and commercial cars of various types. This company, he states, uses a two-ton G. M. C. gasoline truck, which is doing very satisfactory work, and installation of more cars is contemplated for the near future.

Four-horse vehicles are being used beside the one-ton truck. These vehicles are of the ordinary delivery wagon type. The company furnishes its own wagons and keeps them in repair. Sometime ago, the contractor who provides the horses, raised his price $1 a day. This, he said, was necessary because of the high cost of feed. This increase means a raise of about 30 per cent.

With its two-ton truck the company can do more work than could ever be done with horses in the same time. An average of 50 to 75 miles per day is obtained, but occasionally a run as high as 82 miles is covered. A typical day's work is as follows: Highland Park, leaving the store at 8.30, and making thirty-six stops and return to store at 12.15. This run is not less than 30 miles. Reloaded after lunch, the car starts for Caulkner's Point, about 18 miles, with twenty-two stops, and is back at the store at 5.45. This identical performance was repeated three days in succession without variation of time. Horse service could not equal this.

The company does not keep horses of its own, for it believes in commercial car methods. The old car has been in service two years, and depreciation in that time amounted to 23 per cent. The new car is being operated for approximately $11 a day, taking into consideration all items of expense.

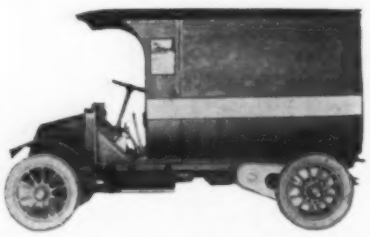
LOADS TRUCK WITH STEAM SHOVEL

An interesting and efficacious method of loading coal into a five-ton, four-cylinder gasoline truck is herewith shown. The loader is a Brown steam hoist, the grab bucket or scoop of which lifts a ton in one load. When this picture was taken the

Loading Truck One Ton at a Time

truck was loaded with steam coal direct from a coal car on a siding. Norman Koenig, of the P. Koenig Coal Company, which operates two of these hoists, the other is seen in the background, expresses satisfaction with the steam hoist as a loader. It also serves as a tractor on occasion. Frequently ten loaded coal cars are moved about the company's yards, and, should by any chance the truck drop into a hole the steam shovel can be used to lift it out. The Koenig Coal Company uses two gasoline trucks, one of which was illustrated in the COMMERCIAL CAR JOURNAL. The truck shown is equipped with a tilting body, and is fitted with a movable steel trap door at the rear. The steam hoist is equipped with shaft drive, with bevel gears and pinions.

The merchant who is about to purchase commercial motor cars should subscribe for the COMMERCIAL CAR JOURNAL, as he will find that it will help him to select the best cars for his use, and enable him to get the best results from them after he has them.



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Chassis - - - - - - - - - - - $1400.00
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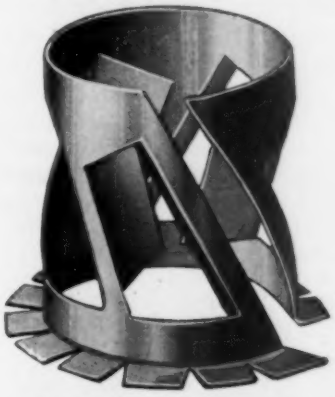

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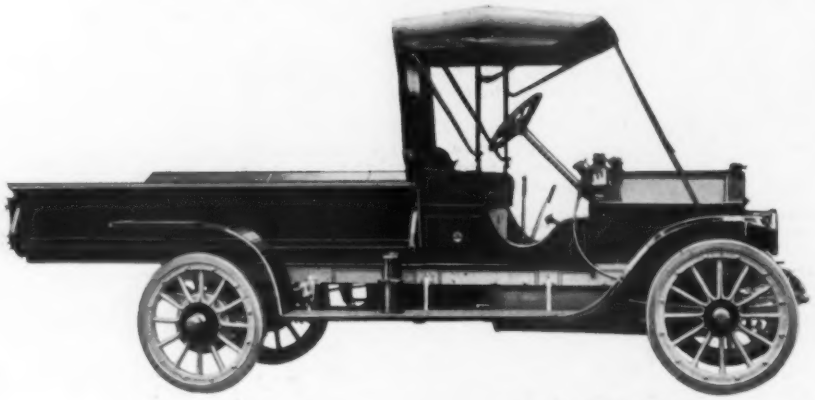

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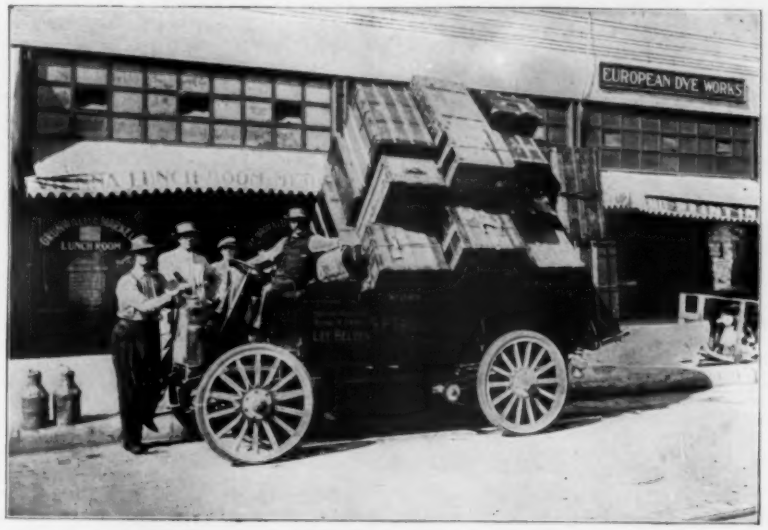

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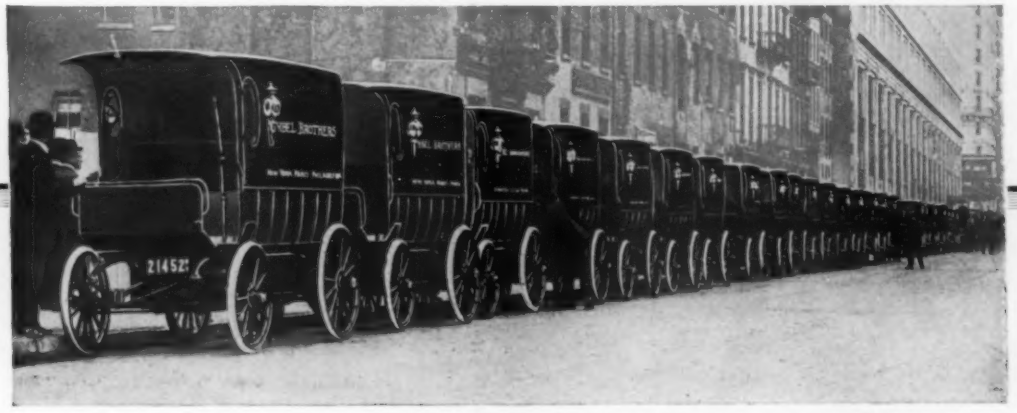
GENERAL VEHICLE CO.
Long Island City, N. Y.

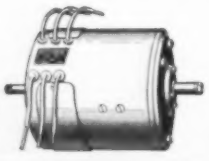


66 Electric Delivery Wagons with Westinghouse Motors, for Gimbel Bros., New York

Electric Delivery Marks The Efficient Store

The most ably managed stores use electric delivery wagons because experience has proved them to be more rapid, economical, and reliable in the delivery of goods than any other kind of vehicle.

Westinghouse Motors Mark The Most Reliable Electric Vehicles



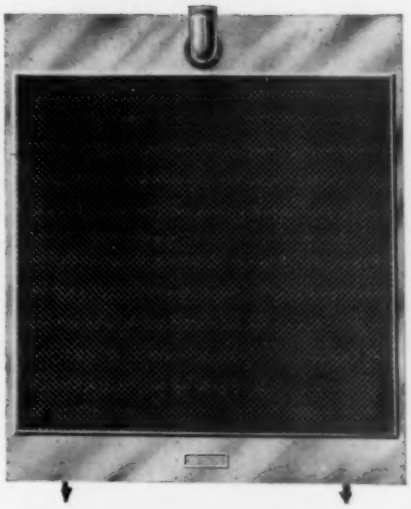
The builders of the best electric vehicles use Westinghouse vehicle equipment because its long record of satisfactory operation proves its high efficiency and thorough reliability.

See that your Electrics have Westinghouse equipment

Westinghouse Electric & Manufacturing Co.

Offices in Forty-Five American Cities **East Pittsburgh, Pa.**

Briscoe Truck Radiators

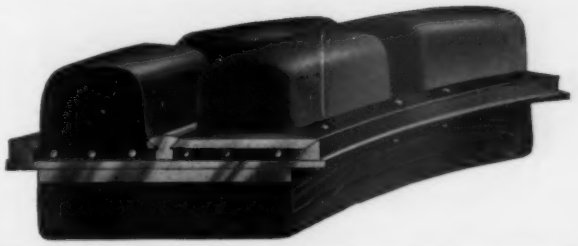


Detroit Honeycomb Type

The Detroit Honeycomb Radiator is the strongest and most efficient Truck Radiator made. It is built on scientific principles, has a free water circulation and in case of accident is easily repaired. It is used exclusively on Grabowsky, Rapid, Reliance and other Motor Trucks.

Write us for Descriptive Catalogue

Briscoe Manufacturing Co.
Detroit, Mich. Newark, N. J.



One of 1912's Sensations

We dislike to show favoritism among our several truck tires, but when a tire creates a country-wide sensation in a half year we deem that tire entitled to special mention.

This, then, is the Goodyear Individual Block Tire.

It differs radically from other block tires in that ***each block has its own fastening.***

Instead of loosening a ***half dozen*** blocks to remove one block, one now loosens but ***one*** block,—the block to be removed.

A rectangular metal plate fits over the extended base of each block.

To release the block, simply loosen 2 bolts, lift the plate and slide it off. Easy. Quick. No tools needed, save clamp and wrench.

Think what a tremendous saving of time and bother it means to be able to replace a block ***instantly*** without disturbing any other block.

This one economy—the *INDIVIDUAL* fastening—is what has made the Goodyear Individual Block Tire the sensation of 1912.

GOODYEAR
AKRON, OHIO
Individual Block Tire

Call at any of our branches and see this labor-saving, time-saving tire. Let our agent demonstrate it. You will be amazed at the utter simplicity of our block fastening.

And when you have looked at the "Goodyear Individual Block," ask to see our new ***Demountable, 10,000-mile Tire.***

If you've a light, high-speed truck, inspect the Goodyear "Solid Detachable" and "Goodyear-Motz" tires.

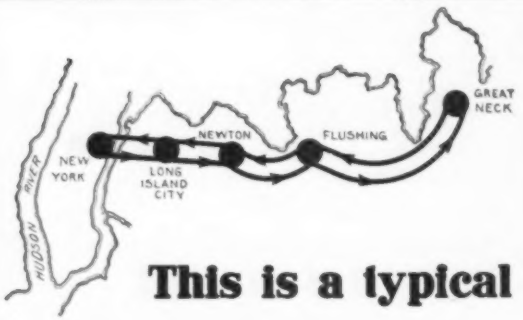
Postal brings latest Tire Book. Write for it.

THE GOODYEAR TIRE & RUBBER CO.
AKRON, OHIO

Branches and Agencies in 103 Principal Cities

We Make All Kinds of Rubber Tires, Tire Accessories and Repair Outfits

Main Canadian Office - Toronto, Ont.
Canadian Factory - Bowmanville, Ont.



This is a typical

Gould Storage Battery Stunt

A large brewing company in New York, having trouble with gasoline cars continually breaking down, recently decided to try out electric vehicles, some equipped with Gould Storage Batteries. An electric truck delivered a 5-ton load to Great Neck, L. I., and returned with a load of empties—distance 45½ miles. Two days later this performance was repeated. It was noted that on trips where electric vehicles equipped with other batteries were used, those with Gould Batteries came back two hours ahead of the others.

This is not unusual for Gould Battery-propelled cars. 45½ miles is a short distance—an everyday matter. But the point is this: Gould cells invariably do their work at a year-in-year-out cost far lower than shown by other batteries.

If you use gasoline cars or electric vehicles propelled by batteries other than Goulds or are figuring on an electric pleasure or commercial vehicle, equip with Gould Batteries and keep tab on first cost, frequency of renewals, cost of renewals, mileage per charge, total mileage, efficiency, etc. Do so and you will eventually equip **all** your cars with Gould Batteries.

There's no question about electric propulsion being best—it is. There's no question about batteries either: Gould's are best. Look into this matter. Facts, figures, and literature await your inquiry. Ask for our free book, "Care of Storage Batteries."

Gould Storage Battery Co.

General Offices: 341 Fifth Ave., New York

Boston: 89 State Street. San Francisco: 904 Rialto Bldg.
Chicago: The Rookery. Cleveland: American Trust Bldg.

WORKS: Depew, N. Y.

Agents in Washington, D. C.; Kansas City, Mo.; Denver, Col.; Detroit, Mich.; Topeka, Kan.; Los Angeles, Cal.; Seattle, Wash. Full stock carried in all cities where we have offices or agents.

34

Motor Lauth Juergens Trucks

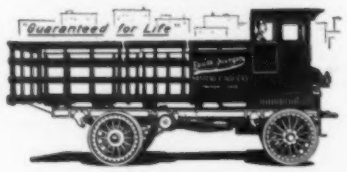
Are Guaranteed For Life

WHAT MORE CAN WE SAY?

Made in 1, 2, 3 and 5-Ton Sizes

Send for Catalogue

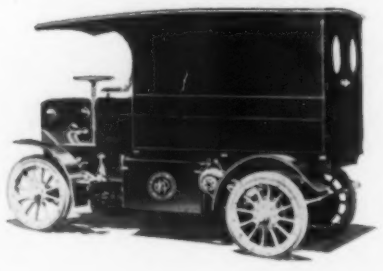
The Lauth-Juergens Motor Car Co.
FREMONT, OHIO



M&P ELECTRIC VEHICLES M&P DETROIT

"Made to Make Good and It Does."

Electric Delivery Vehicles
1000 lbs. and 2000 lbs.
100% Service



Write for New Catalog—now ready

M & P Electric Vehicle Co.
Detroit, Michigan

GRAMM TRUCKS

The installation of Gramm Trucks does not involve a lot of guesswork, you know beforehand what to reasonably expect.

Our experience of more than 12 years building successful motor trucks enables us to tell you just how and where you can save by the use of Gramm Trucks.

We have the largest exclusive motor truck factory in America, satisfactory service made its building possible, and satisfactory service only can keep it in operation.

We will be glad to show you how we can help you; how Gramm Trucks are adapted to your particular business. Tell us your conditions, an investigation will more than convince you of the saving which can be made.

THE GRAMM MOTOR TRUCK CO.
129 So. Lima Street - Lima, Ohio, U. S. A.
Exclusive Motor Truck Builders

The demand for bearings that will not crush under load has given HYATT ROLLER BEARINGS a big lead over all other types.

The flexible principle is a thoroughly tested feature and enables the bearing to withstand sudden shocks and strains and meet successfully the conditions encountered in automobile construction.

Perfect lubrication is made possible by the right and left spirals which distribute the oil evenly over the entire surface of the bearing. Grit and dirt are positively arrested and carried to the inside of the roller. These features insure long life to the bearings.

Our Engineering Department will be glad to go over your plans with you.

Hyatt Roller Bearing Company
Detroit, Michigan

"DISCO" SELF STARTERS

are part of the equipment of such cars as the Packard; Locomobile; Pierce-Arrow; Stevens-Duryea; Simplex; American; Marion, etc. In fact all the leading pleasure cars use them. Thousands of truck owners have equipped their trucks with DISCOS and find it a profitable investment. We can start any engine of any size. We can make immediate deliveries. Results speak for themselves. A card will bring complete descriptive matter.

708 Dodge Building, IGNITION STARTER COMPANY, Detroit, U. S. A.

The
Commercial Car Journal

is the logical paper for every man to read who contemplates buying or selling commercial motor cars.

It is brimful of essential information.

The Commercial Car Owner will also find many suggestions in it that will make his driving more efficient.

Send for a sample copy

Commercial Car Journal
Market & 49th Sts. - - Philadelphia, Pa.

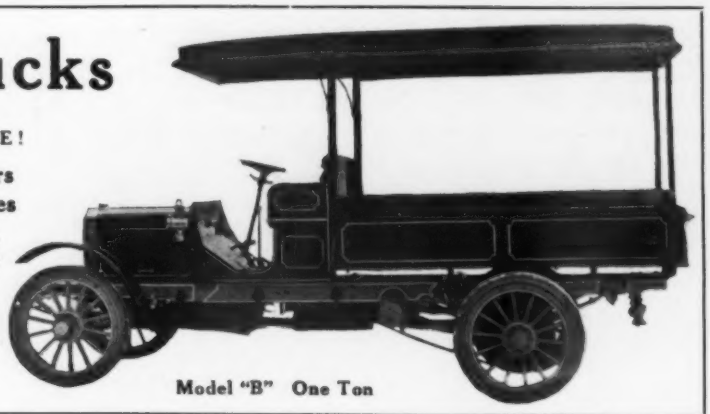
Atterbury Trucks

DELIVER THE GOODS!
THE PERFECTLY BALANCED MACHINE!

Gasoline and Electric Delivery Cars
Motor Trucks Hotel Omnibuses

Write for catalog and details. We are pioneers and can supply any size or type for your purpose.

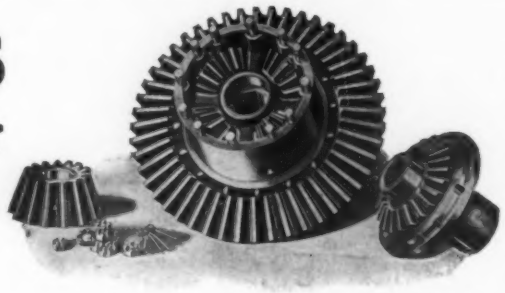
Atterbury Motor Car Co.
BUFFALO, N. Y.



Model "B" One Ton

The ROSS Differential Gear

For Commercial Trucks



Made in three sizes—for trucks of from one to five tons capacity.

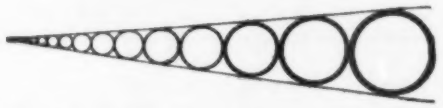
Write for Blue Prints

ROSS GEAR & TOOL CO. ∴ 959 Main Street, Lafayette, Ind.

AUTOMOBILE TUBING

Seamless Brass and Copper Tubing

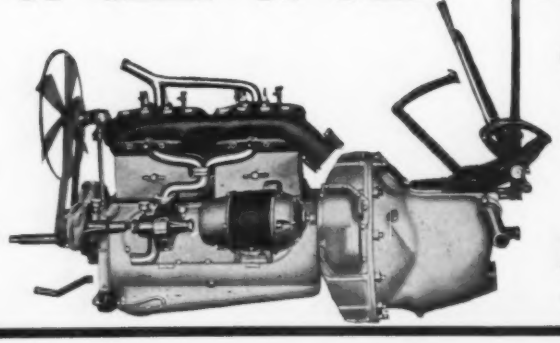
of all kinds,—any size, any gauge, any temper
From ½" down to the finest.



We are supplying many of the largest and best automobile concerns in the country with tubing. Why not let us quote you on your requirements? Our **QUALITY** is guaranteed,—our prices are low as quality will allow, and prompt deliveries are guaranteed. Could you possibly ask for more? **Correspondence solicited.**

ROME HOLLOW WIRE & TUBE COMPANY - Rome, New York

HAZARD UNIT POWER PLANT



Motor, Clutch, Transmission and Gear Shift Control all in One Compact Outfit.

Center Control, Three Point Suspension, Oil Tight, Dirt Proof.

Gear Reduction Integral with Unit Power Plant permits straight line shaft drive to live rear axle, Automatic inclosed Governor.

No Time Limit to Our Guarantee.
Full Descriptive Catalog on Request.

HAZARD MOTOR MFG. CO.
848 Coates Street, ROCHESTER, N. Y.

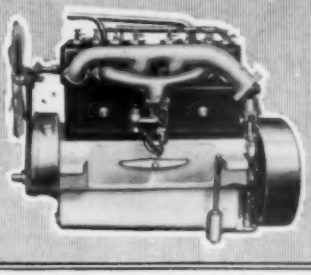
In addition to saving power and wear with every revolution, the worm gear drive of the Pierce-Arrow Truck eliminates the necessity for the almost daily adjustments, repairs and lubrication required by other drives.

PIERCE-ARROW
5-TON MOTOR TRUCKS
THE PIERCE-ARROW MOTOR CAR COMPANY, BUFFALO, N. Y.

YOU wouldn't expect a race horse to do draft horse work. Then why expect satisfactory Truck service with a pleasure-car motor?

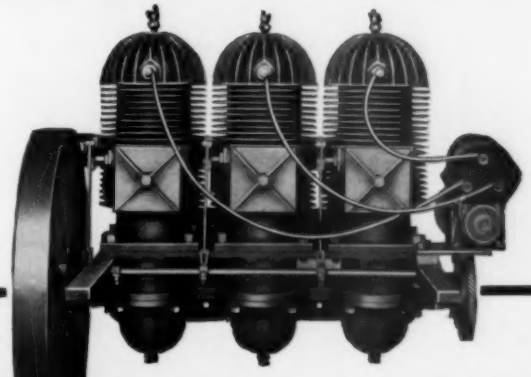
Truck work requires a motor with a capacity for continuous hard work. That is efficiency—and is exactly what you get in the Waukesha Long Stroke Truck Motor. It's a "make good" motor that gives the truck manufacturer full confidence that his truck will do all he claims. Strength—long wear—economy of fuel—the ability to work under all conditions—those are what you get in every

WAUKESHA
4¼×6¾" LONG STROKE TRUCK MOTOR



Waukesha Motor. The crankshaft has a tensile strength of 70 tons. The bearings have three times the wearing quality of ordinary bearings. Let us *prove* the Waukesha Motor's supremacy. Ask us in the next outgoing mail.

WAUKESHA MOTOR CO. Dept. A. WAUKESHA, WIS.



AT LAST The Perfect Two-Cycle Motor with Variable Port-Areas

The essential feature of Moore Motors is the increasing or decreasing of all the port-areas simultaneously (fully patented), giving flexibility of control and fuel economy.

(Fixed ports, as in regular two-cycle design, mean lack of flexibility and high fuel consumption.)

The result is a power plant combining two-cycle simplicity and low upkeep cost, with four-cycle flexibility of control and fuel economy.

Moore Motors are backed by years of engineering experience. Send for descriptive circular.

PALMER-MOORE COMPANY
SYRACUSE, NEW YORK

Remy Magneto

Exchange Your Old Magneto for a New Remy

IT will cost you practically no more than what you will be forced to pay out for constant repairs on your present ignition system. A new Remy will give your car new life. Here is our exchange proposition:

	List Price	Allowance	Net to You
2-Cylinder Remy Magneto with Coil, complete	$46 00	$ 9 20	$36 80
4-Cylinder Remy Magneto with Coil, complete	50 00	10 00	40 00
6-Cylinder Remy Magneto with Coil, complete	52 00	10 40	41 60

Allowance made for any make of Magneto

Remy Electric Company
Anderson, Indiana

BRANCHES:—New York, Boston, Detroit, Chicago, Kansas City, San Francisco, Indianapolis.

SERVICE STATIONS—Albuquerque, Augusta, Baltimore, Charlotte, Cincinnati, Cleveland, Denver, Dallas, El Paso, Houston, Jacksonville, Louisville, Memphis, Minneapolis, New Orleans, Nashville, Norfolk (Va.), Omaha, Los Angeles, Philadelphia, Pittsburgh, Portland, (Me.), Portland (Ore.), Rochester, San Antonio, Seattle, Spokane, St. Louis, Syracuse, Utica, Washington (D. C.).

CANADA—Toronto, Winnipeg, Calgary, Hamilton, Vancouver, Montreal.

Ford
THE UNIVERSAL CAR

New days demand new methods. The store of yesterday can't compete with the store of to-day. An expense-reducing and efficiency increasing Ford delivery car is the best evidence you can furnish your trade that yours is not a store of yesterday.

More than 75,000 new Fords into service this season—proof that they must be right. Three passenger Roadster $590 — five passenger touring car $690—delivery car $700—f. o. b. Detroit, with all equipment. Catalogue from Ford Motor Company, Detroit, Mich.

HAYES
HEAVY TRUCK AND PLEASURE CAR
WHEELS

Strongest, Most Economical and Safest Wheels Obtainable.

After years of experimenting with all sorts of wheels, the most prominent pleasure and commercial car manufacturers in the Automobile industry now specify HAYES WHEELS on their models. They have found that these wheels meet every requirement necessary in perfect wheel construction and that it is impossible to obtain a better wheel than a HAYES at any price.

A wheel that is the undivided choice of the majority of important manufacturers is worthy of your consideration.

A trial will convince you that our statements are true.

You cannot afford to use a wheel you know nothing about—the experience will prove disastrous as well as expensive.

We have been making wheels for 25 years and if you appreciate quality and a reputation for square dealing, we solicit your wheel business.

Our facilities are unequalled, enabling us to meet every requirement with little delay.

No order too small. None too large.

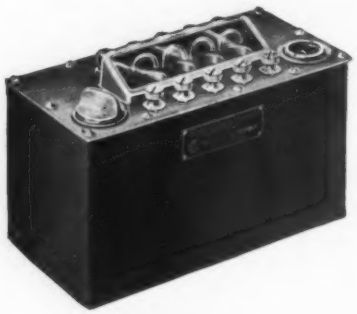
All orders receive our very best expert attention.

May we be favored with your wheel business for 1912?

Consult us on your design. Our Engineering force is at your disposal.

Estimates and details gladly furnished on request.

HAYES WHEEL COMPANY
JACKSON, MICHIGAN



Detroit Oilers have no ball checks

There are no check valves or other complicated parts in Detroit Mechanical Force Feed Oilers to give trouble and cause failures. Every drop of oil **must** go to the place where it is needed.

A separate pump for each feed measures the oil and insures a rate of feed that is **exactly** right at all times. Once properly regulated there is no chance for faulty lubrication and dry bearings, carbonized cylinders, smoke at the exhaust and wasted oil are entirely eliminated.

Detroit Oilers are made with from one to thirty feeds in capacities of two pints to five gallons—pulley, sprocket, ratchet or gear drive.

Made also with two compartments for feeding one kind of oil to cylinders and another to the bearings.

Write today for catalog P-67 and full information.

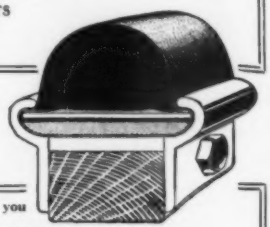
DETROIT LUBRICATOR COMPANY.
DETROIT, U. S. A.
Largest Manufacturers of Lubricating Devices in the World.

REPUBLIC MOTOR TRUCK TIRES

Just as a chain is no stronger than its weakest link, so a truck is no more efficient than its tires.

Republic Motor Truck Tires will increase the efficiency of your trucks by keeping them on the road day after day, by cutting down the cost of maintenance.

Let us show you in dollars and cents.



THE REPUBLIC RUBBER CO.
YOUNGSTOWN, OHIO

These Branches and Agencies will supply you with truck tires and truck tire service:

Albany, N. Y.	Albany Vulcanizing Works
Atlanta, Ga.	The Republic Rubber Co., 237 Peachtree St.
Boston, Mass.	The Republic Rubber Co., 735 Boylston St.
Buffalo, N. Y.	The Bison Rubber Co.
Chicago, Ill.	The Republic Rubber Co., 1732 Michigan Ave.
Cleveland, Ohio	The Way-Mitchell-Rigdon Co., 5919 Euclid Ave.
Dallas, Texas	Slaughter-Randal Co., 2033 Commerce St.
Denver, Colo.	The W. C. Hendrie Rubber Co., 1238 Broadway
Detroit, Mich.	Republic Rubber Co. of Mich., 1001 Woodward
Kansas, City, Mo.	Bart S. Adams, 1513 Grand Ave.
Los Angeles, Cal.	Republic Tire & Rubber Co., 1227 S. Olive St.
Minneapolis, Minn.	The Republic Rubber Co., 1514 Hennepin Ave.
New York, N. Y.	The Republic Rubber Co., 229 West 58th St.
Philadelphia, Pa.	The Lyman Tire & Rubber Co., 328 N. Broad St.
Pittsburgh, Pa.	Lange Motor Truck Co., S. St. Clair and Eva Sts.
Rochester, N. Y.	Rochester Auto & Supply Co., 352 Main St., East
Salt Lake City	The W. C. Hendrie Rubber Co., 210 S. W. Temple
San Francisco, Cal.	Republic Rubber Co. of Cal., Golden Gate Av. & Hyde St.
Seattle, Wash.	Republic Tire Co., 1425 Broadway
Spokane, Wash.	Interstate Rubber Co., 417 First Ave.
St. Louis, Mo.	The Republic Rubber Co., 1215 North Broadway
St. Paul, Minn.	The Republic Rubber Co., 76 West 7th St.
Washington, D. C.	J. M. Doyle, 320-2 Pennsylvania Ave.

From start to finish

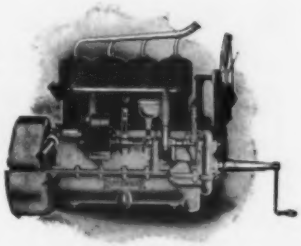
The problem of economical hauling is solved and the line of deliveries is straightened by the power wagon that is free from motor troubles. No matter whether you need a truck capable of hauling the heaviest loads of bulky freight, coal, ores, iron, or general merchandise, or whether you require a light, swift-running delivery car for retail work,

THE RUTENBER MOTOR

should throb under your hood. It means efficiency, endurance, rugged honesty of service, economy of maintenance and unfailing power. For high speed or low, for heavy work or light, or for combination uses, the RUTENBER Motor is the motor of Performance.

More than a score of the highest grade cars in America today are equipped with RUTENBER Motors. The best of trucks are those which place their reliance on the RUTENBER.

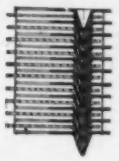
Send for Booklet.



The Rutenber Motor Co.
Marion, Indiana

"EVANS" MODEL "HELE-SHAW" CLUTCH

(*Patented*)



Multiple Disc Running in Oil

The illustration shows wedge shaped annular grooved plates which engage smoothly, *have a grip like iron* yet are *slipable indefinitely.*

Phosphor-Bronze vs. mild steel.

In use on over 100,000 cars.

Send for Catalog No. 7 to-day, giving bore and stroke of motor

"Reg. U. S. Pat. Off."

MERCHANT & EVANS CO.
The Premier Metal House in America
PHILADELPHIA

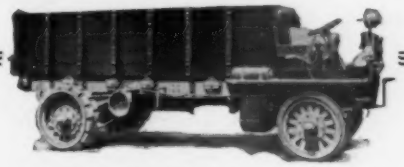
New York Brooklyn Chicago Kansas City
Baltimore Wheeling Cleveland Denver

1 OR 1000

IF IT IS PRESSED STEEL FRAMES

WE CAN FILL YOUR REQUIREMENTS

A. O. SMITH COMPANY
MILWAUKEE



DREADNAUGHT, Model A-6. Capacity, 6 Tons

A Pleasure Car

does not necessarily have to be a passenger carrying automobile. A commercial car that is built right and will run 365 days in the year if necessary is a pleasure car.

B-O-E
Best On Earth

is a commercial car that is designed and constructed for strenuous service. It does work like a pleasure automobile but it isn't built along these lines. Its designers appreciated that a commercial car has to do real work day in and day out.
Note that practically all the weight is carried between the axles and that the construction represents maximum strength.

Made in 2, 3, 5, 6, 7 and 10 Ton sizes

For further particulars, write

MOTOR CONVEYANCE COMPANY
Milwaukee, Wisconsin

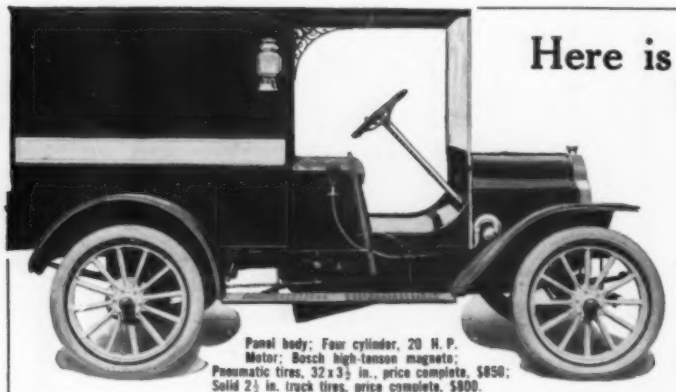
THE KINSEY MANUFACTURING CO.

TOLEDO, OHIO

Manufacturers of Auto Parts—

Kinwood Radiators, Fenders
Kinwood Oilers, Gaskets
Kinwood Steel Frames, etc., etc.

SPECIAL METAL STAMPINGS



Panel body; Four cylinder, 20 H. P. Motor; Bosch high-tension magneto; Pneumatic tires, 32 x 3½ in., price complete, $850; Solid 2½ in. truck tires, price complete, $800.

Here is the 1912 Sensation of the Motor World

COMMERCE CAR

Dealers in all parts of the country are already reaping a harvest from sales of the Commerce Car.
We have some choice territory left for good, active dealers. Do not let this great opportunity pass you buy.

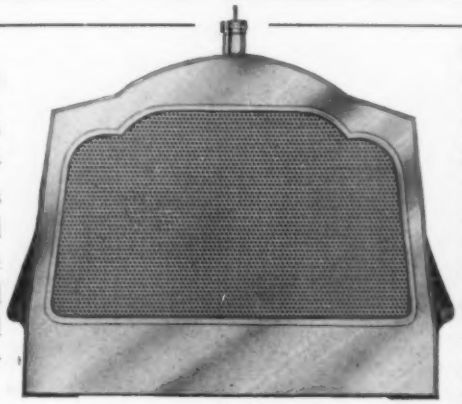
Write us for territory and dealer's proposition

The Commerce Motor Car Company
General Office, 633-639 Penobscot Bldg., Detroit, Mich.

FEDDERS

Real Square Tube Radiators

¶ Commercial cars require radiators that will stand many shocks and much hard usage. This was one of the weak parts of the commercial car but the test of time has proved that FEDDERS radiators render efficient service.



¶ We want to figure with you your requirements for the coming season. If you haven't used Fedders radiators you probably have had a great deal of radiator trouble and you may think that their isn't a radiator built that will give you satisfaction. If this is the case we would like to have an opportunity of demonstrating that the Fedders radiator will stand the wear and tear and shocks of the commercial car and that manufacturers who equip their commercial cars with the Fedders have practically no radiator trouble. We can convince you. Will you give us the opportunity?

FEDDERS MFG. WORKS
BUFFALO :: NEW YORK

THE W. F. STEWART CO.

ESTABLISHED 1881 INCORPORATED 1898

FLINT, MICHIGAN

WE BUILD BODIES

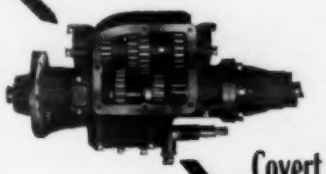
for both pleasure and commercial vehicles, and can give you goods and service that can be depended on. The price, too, will be right. Get in touch with us.

COVERT

The efficiency of Covert Unit Transmission Plants has been proven. You are not experimenting when you equip your cars with the COVERT. We guarantee every one. This part of your car you can safely leave with us.

Our manufacturing plant is equipped with tools and machinery designed for a single purpose,—building transmissions. This enables us to produce highest quality at a cost lower than you can make them yourself.

May we figure with you on your plans?



Covert Motor Vehicle Co.
Sales Office: Ford Bldg.
Detroit, Mich.
Factory: Lockport, N. Y.

Coventry Noiseless Chains as Used on "Benz" Engines

COVENTRY

NOISELESS CHAINS

Have been the standard of Europe for many years. These chains run with remarkable accuracy and precision, their construction and design make them positive and flexible.

Standard equipment on the following cars: **Daimler, Deasy, Humber, Maudslay, Benz, Arrol-Johnson, Vauxhall, etc.** Write for full description and details.

UNITED STATES REPRESENTATIVES:

Sarco Engineering Co., 110 Broad St., N. Y.

Why Not Line Your Old Brakes with

TRADE MARK **Raybestos** REG. U.S. PAT. OFF.

This highly efficient asbestos lining will rejuvenate your brakes. Easily attached. Makes any brake 100% more efficient. Grips and holds. Works with slightest pressure. Practically indestructible. Every foot of fabric stamped—"RAYBESTOS."

Ask your dealer.
Write for Booklet.
All sizes and widths.

We also make DUPLEX and RAYMOND Brakes and GYREX—the Mixer

The Royal Equipment Co.
484 Housatonic Ave., Bridgeport, Conn.

Cut Delivery Costs!

PUT YOUR FINGER ON THE LOSSES

JONES RECORDER gives you a complete record of just what your drivers do when making deliveries. Tells when vehicle leaves stable or garage, number of stops, duration of each stop, mileage between stops, speed, and it also tells when vehicle returns to garage or stable.

Jones Recorder

Does away with loafing and carelessness. The chart puts responsibility where it belongs—it stops the leaks and cuts delivery costs. Write for full particulars.

THE JONES RECORDER

FACTORY: NEW ROCHELLE NEW YORK

Motor Truck Bands

MADE WITHIN THE FOLLOWING

Dimensional Tolerances

(ADOPTED BY THE SOCIETY OF AUTOMOBILE ENG.)

1.—Tolerance in circumference of felloe band:

	Plus	Minus
Before application to wheel	1-32″	1-32″
After " " "	1-16″	1-32″

Variation from precise measurement shall be uniform over entire width of band.

2.—Tolerance in width of felloe band:

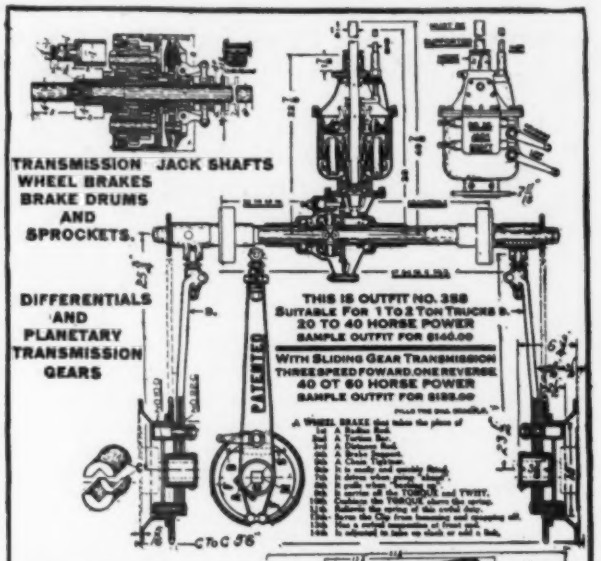
	Plus	Minus
Up to and including 4″	1-32″	1-32″
4—1-16″ to 6″	3-64″	3-64″
6—1-16″ to 12″	1-16″	1-16″

3.—Variation in trueness of band when placed on surface plate: Band shall touch at all points within 1-32″ up to and including 6″ width. Over 6″ width within 1-16″.

4.—Variation in thickness of band: .006″ plus or minus.

5.—Trueness to round. The radial tolerance on the wheel when felloe band is applied shall be 1-16″ plus or minus. This plus or minus tolerance must not occur at diametrically opposite points. There shall be no flat spots or kinks in felloe band on the finished wheel.

The Standard Welding Company
CLEVELAND
NEW YORK CHICAGO DETROIT



HEAVY BUILT
SLIDING GEAR
TRANSMISSIONS
3 SPEEDS FORWARD,
ONE REVERSE
FOR 20 TO 60
HORSE POWER, FOR
TRUCKS CARRYING
1 TO 4 TONS

SEND 10 CTS. IN STAMPS FOR LARGE CATALOGUE

MUNCIE GEAR WORKS, MUNCIE, IND.

"HARTFORD" CONE CLUTCH
THE BEST

Furnished with Double Set of Universal Joints. Clutch can be removed from car as a unit without disturbing other parts. We furnish either Pressed Steel or Aluminum Cone. Weight same. Complete equipment 30 lbs. Made in two sizes, 25-30 and 35-40 H. P. Price is Right.

HARTFORD AUTO PARTS COMPANY
HARTFORD, CONN.
The J. S. Bretz Co., New York, Detroit, Sole Selling Agents

Your Motor Trucks are not limited to well paved Streets, but will go anywhere—and come back—If your tires are

Diamond Wire Mesh Base (Spliceless) Motor Truck Tires

The one successful type of solid rubber motor truck tires.

The Diamond Rubber Company of N.Y.
AKRON, OHIO
SUBSIDIARY OF THE B. F. GOODRICH CO.

"My car has a dingy, second-hand look already. The finish on the hood and fenders has lost its lustre."

"There is only one remedy. Let me use on them this time the new varnish which is not affected by soapy water, or by road oil and mud,

Valentine's Vanadium Chassis Finishing"

Be in a position to make this answer to the car owner who comes to you for advice and a good job.

The ordinary varnish is so quickly destroyed on an automobile that the painter generally gets the blame. Get the friendship of the car owner instead of his ill will by finishing his car with Valentine's varnishes.

Vanadium Body Varnish for the body.

Vanadium Chassis Finishing for the hood, fenders and underparts.

Write a line for booklet, "The Care of the Car."

Valentine & Company

Established 1832

TRADE VALENTINES MARK

456 Fourth Avenue, New York
343 So. Dearborn St., Chicago
74 Pearl Street, Boston

No Other Tire Offers These Economies

Motz Cushion Tires not only wipe out tire repair bills, but each set is **guaranteed** for 10,000 miles—two years.

Moreover, Motz Cushion Tires give the same protection to the delicate mechanical parts of a light commercial car as pneumatic tires.

And these tires are amazing power savers. For repeated tests show that a motor car, on a given charge of fuel, travels farthest when Motz equipped. Motz Cushion Tires mean ECONOMY in every sense.

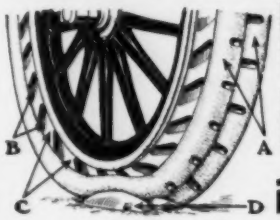
Motz Cushion Tires

have double, notched treads (A in picture) which prevent skidding and distribute the weight to the sides. The undercut sides (see B) allow free action of the bridges. The slantwise, elastic bridges (see C) give and yield like the air in pneumatic tires.

They fit any standard clincher, universal quick detachable or demountable rim.

Postal brings latest Tire Book, 85. Please mention make and model of your truck.

THE MOTZ TIRE & RUBBER CO., Factories and Executive Offices, **Akron, O.**



Branches: 1737 Broadway, N. Y.; 2023 Michigan Ave., Chicago; 999 Woodward Ave., Detroit; 2352 Euclid Ave., Cleveland; 409 E. 15th St., Kansas City, Mo.; 1409 Race St., Philadelphia. Standard Tire & Rubber Co., 104-6 Portland St., Boston, Mass., Distributors for New England States.

Decatur 1½ Ton Truck

The Truck with a reputation for

Economy Efficiency Durability and Low Operating Cost

Our Trucks are used in 61 different lines of business. Write for catalog and complete specifications telling WHY DECATUR TRUCKS ARE BEST.

Grand Rapids Motor Truck Co.
Grand Rapids, Michigan

Adams Trucks
"Deliver the Goods"

LUMBER DEALERS USING ADAMS TRUCKS

find them not only more economical than their old system of hauling, cutting down this item of expense, so often lost sight of, but are able to do the same work in about one-third the time, thus enabling the truck to handle from two and one-half to three times the lumber handled by the old method.

The truck shown below is especially adapted for the handling of lumber and building materials. Equipped with a platform stake body of generous dimensions, it enables the dealer to handle extremely long lengths by allowing them to extend forward on either side of the driver's seat.

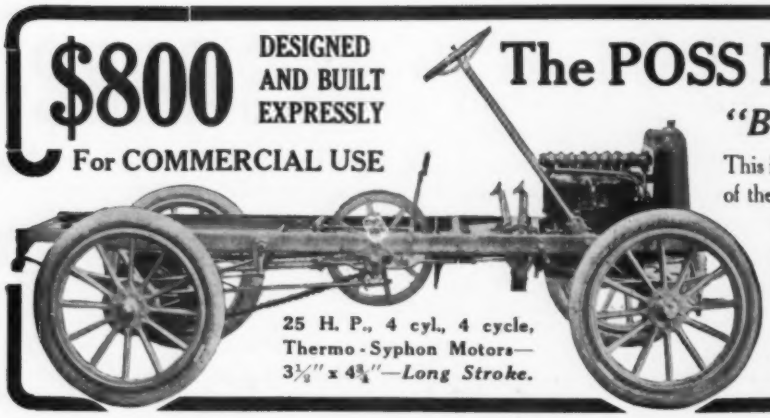
Let us tell you more about this truck and why your decision should be an ADAMS.

THE ADAMS BROS. CO.
FINDLAY, OHIO

$800 DESIGNED AND BUILT EXPRESSLY For COMMERCIAL USE

The POSS MOTOR WAGON

"Built for THE PURPOSE"



This is the secret of the Power, Strength and Durability of the Engine and Chassis of the Poss Motor Wagon. It is not a converted pleasure car. It has not a pleasure car engine. It has not a pleasure car transmission. It is a Power Wagon, with Power.

25 H. P., 4 cyl., 4 cycle, Thermo-Syphon Motors—3½" x 4¾"—*Long Stroke.*

Wide-Awake, Hustling Agents Wanted
Send for our Proposition To-day

THE POSS MOTOR CO., 506 Howard Street, Detroit, Mich, U. S. A.

BUCKEYE Motor Truck Jacks

Buckeye Motor Truck Jacks are safe, reliable and made to stand the wear and tear for which they are intended. They are fully guaranteed, and cannot possibly drop with a load. They are made from Steel Drop Forgings, best finish and workmanship throughout.

Get our prices before you place your orders for jacks, we can save you money.

No.	Height Bar Down	Raise of Bar	Height Bar Up	Weight	Capacity		List Price
7	11¼"	6½"	18"	16 lbs.	2½ tons	with formed handle	$10.00
13	14¼"	7⅛"	20⅜"	26½ "	3 "		15.00
14	14¼"	7⅛"	20⅜"	33 "	5 "		16.00
9	11½"	6"	17½"	10 "	1½ "		6.00

Write today for descriptive catalog. Made only by

THE BUCKEYE JACK MFG. CO., Alliance, Ohio

"American made for the American trade"

New Departure Guaranteed Ball Bearings

Are in 60% of the 1912 Cars

Contracts for 1913 cover 80% of the entire output of American automobile manufacturers next year. Reason—New Departure ball bearings have no superior.

Have you had our 1912 Catalog?

THE NEW DEPARTURE MFG. CO. :: BRISTOL, CONN.

Western Branch: 1016-17 Ford Building, Detroit

SEAMLESS

MOTOR TRUCK GASOLINE TANKS

LEAKLESS

STRONG AND STURDY FOR ROUGH SERVICE
ALL SIZES IN STOCK

AIR PRESSURE RESERVOIRS FOR SELF-STARTERS AND GARAGE TIRE FILLERS

New Catalog Now Ready—Write Us

COMPRESSED AIR MOTOR TRUCK STARTERS COMPLETE

SPLITDORF MAGNETO

"Always There"

Louis Disbrow of motor racing renown and an ardent SPLITDORF IGNITION enthusiast, wired the following significant message from Kansas City, Mo., on June 15:—

"SPLITDORF equipment on Simplex Cyclone, enabled me to break all local records, track race meet here, today. Your equipment has made the Simplex seven miles an hour faster. My congratulations."

Just as surely as SPLITDORF IGNITION demonstrated its reliability for Disbrow, so surely is SPLITDORF SERVICE to be counted upon for SUPERIOR RESULTS.

IF YOU DO NOT BENEFIT from this SERVICE the fault is your own. Our experts are at your call—our branches, which are miniature factories in equipment, are scattered throughout the country and our inflexible rule is—"SATISFY THE CUSTOMER."

Come to us with your ignition troubles—we will gladly shoulder all responsibilities for changes and adjustments and guarantee the greatest satisfaction.

Write for our "Racing Record"

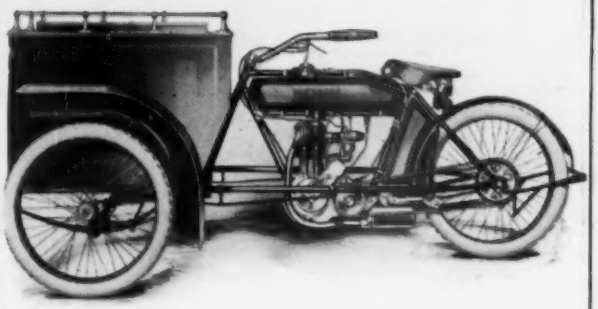
SPLITDORF ELECTRICAL CO.
Walton Avenue and 138th Street
Branch: 1679 Broadway NEW YORK

CHICAGO BOSTON LOS ANGELES
DETROIT KANSAS CITY SAN FRANCISCO

Less than $1.50 Per Day

Minneapolis Light Delivery Cars solve your delivery problems. We can prove to you that you can operate one of these cars at less than $1.50 per day, including everything—driver, gasoline, oil, tires, etc.

And will do the work of three horse-drawn vehicles.



Initial cost for complete car is only $375. Simple to operate, handles like an automobile. Write for details.

The MINNEAPOLIS MOTORCYCLE CO., Inc.
517 South Seventh Street, Minneapolis, Minn.

Schwarz Patent Spokes

Why

Is the Schwarz Wheel used on all the leading Motor Trucks?

Because it is the STRONGEST, SAFEST, and most ECONOMICAL, and will stand up where every other fails.

The special features of construction—the interlocking spokes—the tight immovable center assemblage—insure the wheel under the most severe strain. Spokes cannot work loose, and it will always run true.

You want the BEST for it is the CHEAPEST in the end.

Write for information. Consult us on design and proportion.

THE SCHWARZ WHEEL COMPANY
FRANKFORD, PHILADELPHIA

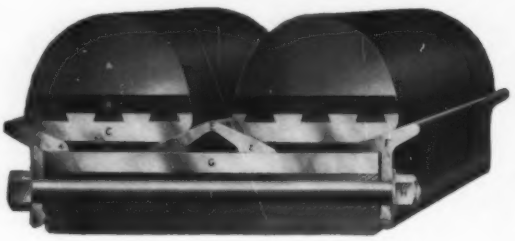
"Reliable Springs are More important on Commercial Cars than on Pleasure Cars."

THE PERFECTION SPRING CO.
Cleveland - - - - - Ohio

The

United States Standard Motor Truck Tire

(Demountable)



has established standards of tire economy never before known.

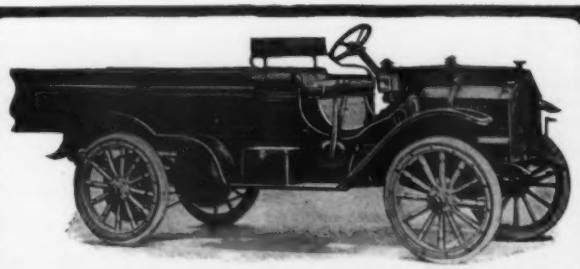
No more delays while tire replacements are being made. Changes can be made by the driver **anywhere** in fifteen minutes' time or less.

Guaranteed for 10,000 miles if used in one year.

Write us for descriptive literature.

United States Tire Company

New York

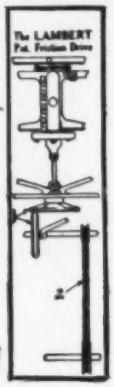


THE LAMBERT MOTOR TRUCK

The first investment is not the most important consideration in the purchase of a motor truck. It is important that you study the construction—what will it cost you in time and money to get like results from different types of cars?

The Lambert Patented Friction Drive will give you more service at less expense than any truck built. This is apparent by studying the illustrations in this advertisement. That on the left shows the usual form of power transmission. That on the right the **Lambert Patented Friction Drive.** Six expensive complicated units, as compared to two simple components. Granted that the results from the gear transmission are equal to the friction, which is the more economical? The cost of lubricating oil alone in the one on the left, will amount to more than the replacement of parts on the **Lambert Friction Drive.**

The Lambert is trouble proof, and cannot be damaged by carelessness or inexperience. It overcomes the chief objection to commercial cars.



We have prepared some very interesting literature for you. A card brings it to you.

The Buckeye Manufacturing Co.

146 Columbus Avenue

ANDERSON, INDIANA

MERCURY TRUCKS

1000 lbs. Capacity

The result of 10 years' experience proves it not an experiment.

You may as well buy now.

Our product is standard, changes are unnecessary, and there will be no yearly models.

Manufacturers not assemblers.

The Mercury Manufacturing Company

4106 S. Halsted Street, Chicago, Illinois

A prominent Truck Manufacturer said:

"We are using several of your 'Gaylor' truck grips here at the factory and have distributed a number of them among truck owners in this vicinity. We believe it is a good grip and it certainly served its purpose during the very bad weather existing in the past."

Don't wait until your car is stalled before ordering a set—get them now and insure your delivery record. The tool box will carry them.

Catalogue on request

Atlas Chain Company

Bush Terminal No. 4

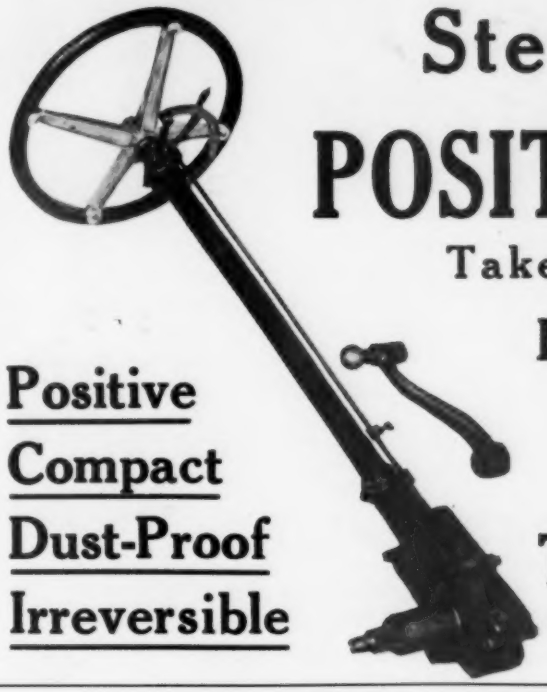
Brooklyn, N. Y.

LAVIGNE

Steering Gears

POSITIVELY No Back Lash
No End Thrust
No Loose Parts

Takes Up Automatically



Positive
Compact
Dust-Proof
Irreversible

FOR TRUCKS
DELIVERY WAGONS
TAXICABS

THE LAVIGNE GEAR CO.
Corliss, Wisconsin

Truck Economy is Dependent

Upon Knowledge of Truck Mileage

Veeder

Hub Odometer

$25

At Your Dealer's or Direct from Factory

You, as a commercial car user, must look upon the money paid for trucks as just as much of an investment as money paid out for supplies, additions, stocks, etc., and *you should insist on a proper return from this investment as well as upon the others.*

To make your truck investment pay it is ***absolutely essential*** that accurate records be kept of the distance the truck travels. By such records, and only by these records, can you check your tire guarantee, your drivers' capabilities, gasoline and oil consumption per mile, cost per ton for each mile, etc., etc.

The VEEDER HUB ODOMETER will do this necessary work for you. It registers backwards as well as forward. It is sealed, so cannot be tampered with or altered. It simply takes the place of the regular hub cap and ***can be attached by any mechanic.***

No Intricate Wiring, No Cables
No Magnets, No Tubes

All we need to know is make, model, size of wheel and year of manufacture of your truck. We ship the HUB ODOMETER to you and you do the rest. Being made by the Veeder Manufacturing Company, whose recording instruments are world-famous in all lines of business, is a sufficient guarantee that the VEEDER HUB ODOMETER is simple, accurate and durable.

Send for Catalogue D, descriptive of HUB ODOMETER.

The Veeder Manufacturing Co., Hartford, Conn.

Makers of Cyclometers, Odometers, Tachometers, Tachodometers, Counters and Small Die Castings.

VANADIUM

The Steel of Ultimate Quality

ELASTICITY STRENGTH TOUGHNESS ENDURANCE

Chrome Vanadium Steel Steering Lever bent cold
Elastic Limit 100,000 lbs.

Vanadium is the only element that greatly increases the elastic limit and tensile strength of steel without impairing its ductility

Our Ferro-Vanadium is the standard for making Vanadium Steel

Booklets and expert advice on application

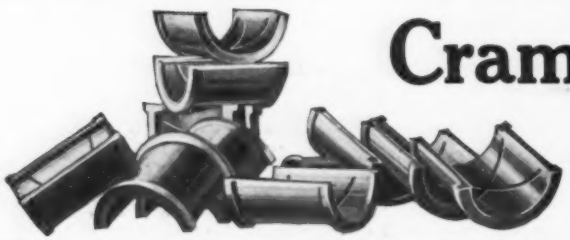
American Vanadium Company

Largest Manufacturers of Vanadium Alloys in the World
Immediate shipment, any quantity

339 Vanadium Building, PITTSBURGH, PA.

LONDON PITTSBURGH

Parsons' White Brass and Cramp's Special Bearing Bronze



These metals are used by the following companies among many others:

AMERICAN LOCOMOTIVE CO.
PEERLESS MOTOR CAR CO.
LOCOMOBILE CO. OF AMERICA
WINTON MOTOR CARRIAGE CO.
LOZIER MOTOR CO.
PACKARD MOTOR CAR CO.
BENZ AUTO IMPORT CO. OF AMERICA
MOON MOTOR CAR CO.
OHIO MOTOR CAR CO.
E. R. THOMAS MOTOR CAR CO.
MAIS MOTOR TRUCK CO.
CHALMERS MOTOR CAR CO.
F. B. STEARNS CO.
ALDEN SAMPSON MANUFACTURING CO.
MACK BROS. MOTOR CAR CO.
VELIE MOTOR CAR CO.
NATIONAL MOTOR VEHICLE CO.
R. C. H. CORPORATION
DORRIS MOTOR CAR CO.
MERCER AUTOMOBILE CO.
KISSEL MOTOR CAR CO.
WOODS MOTOR VEHICLE CO.
ABBOTT MOTOR CO.
REO MOTOR CAR CO.
INTERNATIONAL HARVESTER CO.
SAURER MOTOR CO.

These manufacturers have earned a reputation for their cars only by the expenditure of thousands of dollars and long years of hard labor. They cannot afford to risk this hard-earned reputation by the use of inferior metals—injury to a few cars would destroy the reputation of their entire output.

Our guarantee of quality, uniformity and fair treatment is back of every casting sold

The William Cramp & Sons Ship & Engine Building Co.

PHILADELPHIA, PA.

FOOD FOR THOUGHT

Wasted Energy--Low Efficiency

Some shops are still "lapping in" gas engine cylinders by hand, as the above cut shows, and are doing a lot of hard work to accomplish something that can be done better and easier another way, as shown in the following cut.

This **one** man with the use of a Heald Cylinder Grinding Machine has obtained an output per day that it would require **several** men to equal, if they used the Reaming and Lapping method, and has produced **more accurate** and **better finished** holes, than it would have been possible to obtain in the other way.

How and why is explained in our booklet on "Cylinder Grinding." Copies sent free on request.

THE HEALD MACHINE CO.
12 New Bond St., Worcester, Mass.

CULLMAN SPROCKETS and Differentials

in stock and to order.

Send for catalog and let us quote you on your requirements.

CULLMAN WHEEL COMPANY, CHICAGO
1351 GREENWOOD TERRACE

KOEHLER COMMERCIAL CAR

CARRYING CAPACITY 1600 LBS. $ PRICE 750.

Every Merchant Can Afford To Purchase This Delivery Wagon

The cost of the KOEHLER is less than that of two good horses and horse-drawn delivery wagon. The KOEHLER costs much less to operate. Every merchant who now uses horse-drawn vehicles is a prospective KOEHLER Car purchaser.

OPEN FLARE-BOARD TYPE

Large and roomy. Inside measurements, 44 inches wide, 84 inches back of driver's seat to rear. Flare-boards, 17 inches above floor. Strongly ironed throughout, also ironed to receive four-post canvas top, which can be had from stock at $40 additional. CAPACITY, 1600 lbs. PRICE, $750.

Prices of various types of bodies range from $40 to $150 extra.

Various types of bodies are obtainable. The Panel Type B is an unusually handsome job. Price $150 extra. Inside measurements 42 inches wide, 53 inches from floor to top, 84 inches back of driver's seat to rear. Canvas side body similar in appearance to Panel Type B—$50 extra.

The KOEHLER solves every delivery problem. It delivers merchandise quickly, easily and at minimum cost. It is very simple in design and anyone can run it.

It is the logical wagon for the very small as well as the largest merchant—in fact it is the ONE commercial vehicle available for all purposes—the only car of 1600 lbs. capacity selling for $750—it is aptly called—

The Maximum Car at Minimum Cost

THIS IS THE FACTORY

"Built in Newark, N. J."

SPECIFICATIONS

MOTOR—2-cylinder opposed, 22-24 H. P. Lubrication mechanical and integral with motor; 300 miles one supply of oil.
COOLING—Thermo-syphon system.
IGNITION—Bosch High-Tension Magneto. No batteries or coil needed.
CONTROL—Left hand, throttle lever on steering column.
DRIVE—Direct line double universal joint with jack shaft. Final drive from jack shaft to rear wheel sprocket through double side chains.
TRANSMISSION—Planetary type. All gears genuine chrome nickel steel, hardened throughout, running in constant oil bath.
BRAKES—Service brakes on jack shaft. Emergency brakes simple in design, extraordinarily powerful, operated independently.
TIRES—2 in. Solid Rubber.
TREAD—58 in.
CAPACITY—1600 lbs.
WHEELBASE—85 in. Wheels—36 in. front, 48 in. rear.
SPEED—4 to 16 miles per hour.
PRICE—$750 to $900, depending on body equipment.
OIL TIGHT CASE—In which transmission, differential, bevel gears and metal to metal clutch run in a CONSTANT OIL BATH. 1,000 miles with one supply of oil.

DEALERS

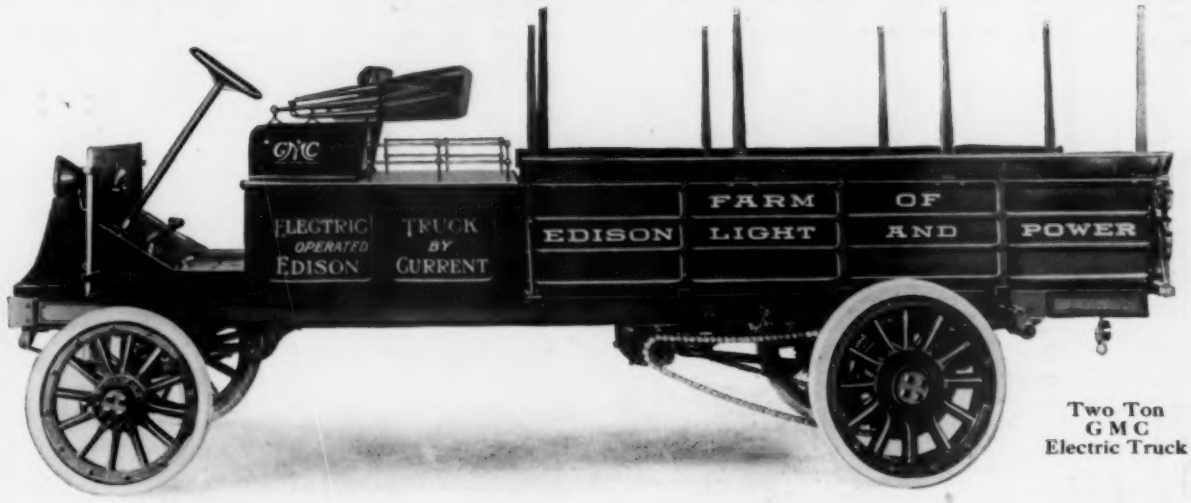
WRITE TODAY FOR AGENCY TERMS AND FULL PARTICULARS

Address all correspondence to

H. J. KOEHLER S. G. Co., 1709 Broadway, New York, N. Y.

COMPLETE INSTALLATIONS — GASOLINE GMC ELECTRIC TRUCKS — COMPLETE SERVICE

Trucks for Every Haulage Purpose



Two Ton
G M C
Electric Truck

ANALYZING delivery problems and installing types of motor trucks with capacities that afford the utmost in economy—*that solve your problem*—is the big, central idea of General Motors Truck Company.

Your business may only need a small equipment of trucks—or a fleet of trucks, combining big and small, gasoline and electrics. Our experts determine that. Our factories manufacture both gasoline and electric trucks that have the widest range of capacities—1000 lbs. to 6 tons.

No matter what your needs may be, understand that successful and economical motor transportation is more readily secured through the installation of a *single line* of highly standardized trucks than buying different sizes and power from different manufacturers. *It means you can look to and depend upon a single centre of responsibility and service!*

Business with both great and small transportation problems are standardizing because, with farsightedness, they realize its advantages. Business that buys a single truck today must study this important fact, too, for tomorrow it may need another, and so on until it has acquired a number. It is important that you deal with the manufacturer who *can* supply your needs!

General Motors Truck Company has a vast equipment, with the mechanical resources, engineering ability and financial prestige of General Motors Company behind it. Today it stands ready to help *you* solve your haulage problems whether they be great or small; *to show you* why it is good business to install G M C trucks.

Let us analyze your transportation, tell you what you need and supply trucks that *exactly fit* your requirements.

Correspondence from prospective purchasers and dealers is invited. Write for gasoline and electric catalogs.

GENERAL MOTORS TRUCK COMPANY

29 Cadillac Ave., PONTIAC, MICHIGAN

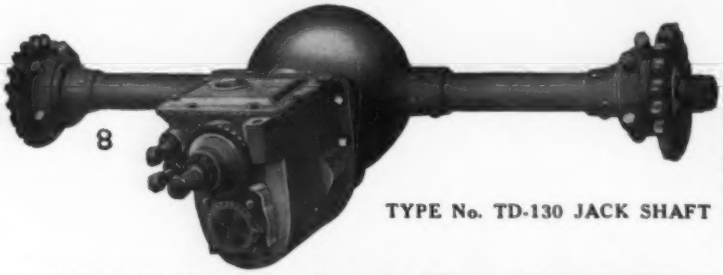
Branches: New York, Chicago, Boston, Philadelphia, Kansas City, Detroit

SHELDON

ONE TON EQUIPMENT
It's Ready For You

When we say this equipment is ready, we mean it has been thoroughly tried out, and that we are in a position to accept orders for prompt shipment.

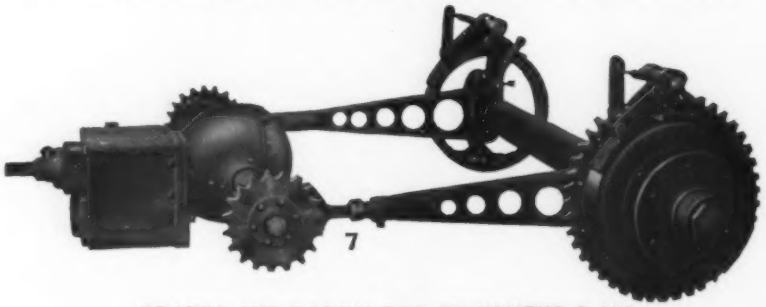
Radius Rods Designed to take care of all operating conditions



TYPE No. TD-130 JACK SHAFT

14 inch Brakes, Pressed Steel Drums, with sprockets riveted on

A VERY COMPACT SUBSTANTIAL PROPOSITION



BRAKES AND RADIUS ROD EQUIPMENT D-132

Our One Ton Front Axle is I-Beam style with spring pads forged integral. Rear Axle also has integral spring pads.

We furnish a standard set of springs to go with this One Ton Equipment.

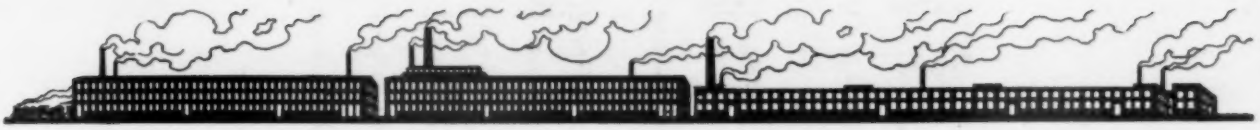
Order Axles, Jack Shaft, Transmission, Brakes, Radius Rods and Springs all from one source—one shipment.

Our Bulletins Give Facts Worth Getting

SHELDON AXLE COMPANY
WILKES-BARRE, PA.

Branch Office
68 East 12th Street
CHICAGO

Branch Office
1215 Woodward Avenue
DETROIT



WESTON-MOTT CO. FACTORIES AT FLINT, MICH.—LARGEST MAKERS OF AUTOMOBILE AXLES, HUBS AND RIMS IN THE WORLD

A Car Fitted with

WESTON MOTT CO

Axles
Hubs
Rims

Has a certificate of character that it could get in no other way

Each working part is accurately adjusted before we send it out

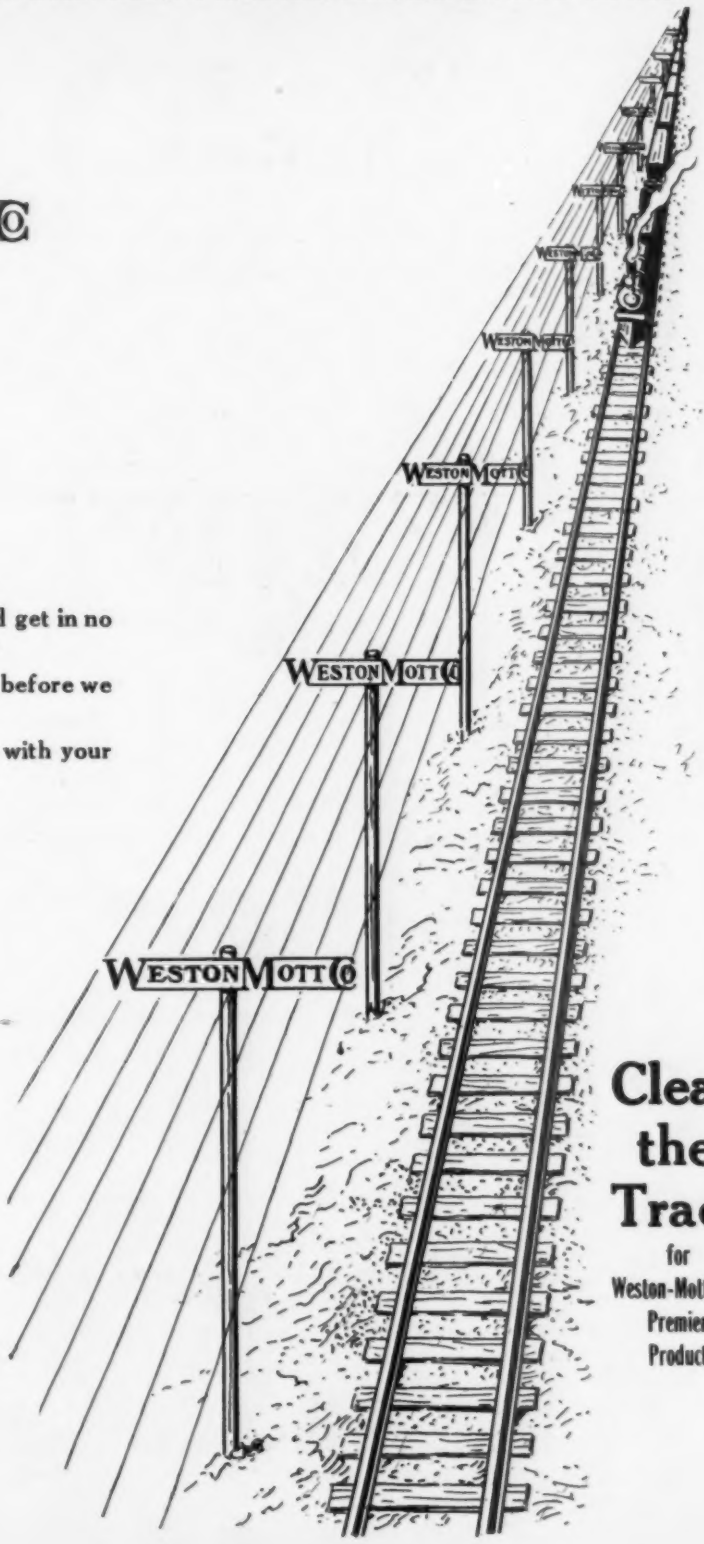
Let our expert engineering staff help you with your designs

Every part is tested and thoroughly inspected before it leaves our factory

---

Flint, Mich.

R. S. V. P.



Clear the Track

for Weston-Mott Co. Premier Products

When you purchase tires you buy more than rubber.

You get either the benefit of experience or suffer for the lack of it. The Gibney type of tire is three years ahead. We introduced it 1909. It is being universally copied in 1912

J. L. G. & Bro. 8/1/12

GIBNEY Wireless

The Three-Years-Ahead Tire

FROM WHOM DO YOU WANT TO BUY THE MOST popular type of tire?—from the manufacturer who has had, or has to get experience? Which would you rather pay for?—your own or the manufacturer's experience? This ought not to be a difficult question for you to decide, and this is another reason why

GIBNEY TIRES

represent to you the best value.

This column does not contain any of our own reasons why you should buy

GIBNEY TIRES

The following is a letter which we received from an enthusiastic user.

Extract from letter dated June 7th, 1912:

" . . . . We have tried four or five other make tires but find that Gibney Tires give us the most mileage and satisfaction. Our business is principally out of town work, and we meet with all kinds of road conditions and therefore have replaced all other make tires with the Gibney Tires."

Respectfully yours,

L. CURTH & SONS
Moving and Storage
Brooklyn, N. Y.

TIRE SERVICE

THE number of miles—which means maximum life—is the main factor to be considered in the purchase of solid tires. The fact that **Gibney Wireless Tires** have been able to show a much better average mileage than other makes is the reason why

GIBNEY TIRES

have been popular with the user and copied by other tire makers. This is pretty good tire insurance. Let us know your requirements, so that we may quote you prices.

JAMES L. GIBNEY & BRO.

213 N. Broad Street, Philadelphia **248-52 W. 54th Street, New York**

The Reason of the Lead Battery

Suppose that for many years the world had had the tungsten lamp and that the carbon filament lamp had only recently appeared upon the market. The promoters of the carbon type would doubtless be making fanciful claims of its superiority over the tungsten, especially in regard to its greater life, even though the current bills would be materially increased by its use and even though the quality of light would not be as good. By reason of its novelty and by appropriate advertising, some market could be created for the carbon lamp even at a considerably higher selling price.

The lead battery of to-day is the tungsten lamp of its art, but the superiority of the lead battery over the nickel-iron battery is greater than that of the tungsten lamp over the carbon lamp, for while the tungsten lamp is more expensive than the carbon lamp, the lead battery costs only about one-half as much as the nickel-iron battery.

The Following Statements Are Facts

Efficiency

The cost of charging a nickel-iron battery is from 1⅝ to 2½ times that of charging a lead battery for the same output.

Flexibility of Design

The choice of Plante plates, composite plates, pasted plates, and the variety of modifications and thicknesses in which the various types of lead battery may be manufactured, render it possible to meet almost any set of conditions in the most efficient and economical way.

Weight

The weight of a lead battery of a given output varies with the design of the battery, and, where high capacity for a given weight is an important factor, thin plates of the pasted type are used. Thin plate batteries of the lead type are marketed, a given weight of which, on each discharge, will propel an automobile as far as or farther than the same weight of nickel-iron battery under ordinary road and service conditions.

Space

Where it is necessary to minimize space the lead battery again can be designed to meet this requirement. Fifty per cent. more capacity can be put into the same space in lead battery than is possible in the nickel-iron type. In New York City real estate is expensive and space is valuable. "Exide" Batteries of special design representing 26,000 K. W. at the 1 hour rate of discharge have been installed for central station stand-by work in New York City alone.

Care

Lead batteries are so generally used that the operating public know how little attention they really require.

Temperature

The nickel-iron battery, on account of its critical temperature characteristics, is practically inoperative in winter unless kept warmed to a temperature above 40° F. The lead battery has no critical temperature below which it will give little or no capacity. The normal electrolyte is of a strength to enable the battery to operate best when surrounded by atmosphere of normal temperature. When the battery is to be operated continuously at abnormally high temperatures, a compensation in the strength of the electrolyte will adapt it to meet this condition.

Discharge

The lead battery can be discharged repeatedly on short circuit without injury. The short circuit current is from two and one-half to five times that of the nickel-iron for similar work, because its internal resistance is only 20 to 40 per cent. as much.

Charge

Lead batteries can be "boosted" or partially charged for moderate intervals at a current rate from 1⅝ to 2¼ times that for the nickel-iron type for the same amount of heat generated. This is on account of the lower internal resistance of the lead battery, the internal resistance of the nickel-iron battery being from 2½ to 5 times that of an equivalent lead battery. Such boosting of a fully or partially discharged lead battery is at practically 100 per cent. ampere hour efficiency, as there is practically no gassing. The limitations of such charging in any type of storage battery are heating and gassing. There is less gassing in charging a lead battery than in the case of the nickel-iron type.

Performance

Its exceedingly low internal resistance renders the lead battery peculiarly adapted to any power work requiring heavy or severe overloads. To make a heavy or sudden demand upon a battery having a high internal resistance such as the nickel-iron battery, is like opening wide the throttle of a steam engine connected to the boiler by too small a pipe line; no matter what the capacity of the boiler may be, it cannot discharge its energy at a high rate.

Life

Five new Submarine boats furnished with "Exide" Batteries are about to be delivered to the U. S. Navy. During the past 6 years 15 submarine boats have been furnished to the U. S. Navy, carrying "Exide" batteries as standard equipment. No complete plate renewals have been made to any of these batteries, and this service has shown the average life of the plates to be more than 5 years. The "Ironclad-Exide" Battery has a life of from two to three times that of the "Exide". The fact that "Exide" Batteries in U. S. Navy gun-firing service have given excellent satisfaction proves that such batteries can and do stand up under what is probably the most severe mechanical treatment imaginable.

Besides the above facts, there are others, and these could possibly be expanded into a continued story in fifty-two or more installments, if such were considered desirable or necessary.

THE ELECTRIC STORAGE BATTERY CO.

Manufacturer of

The "Chloride Accumulator" The "Tudor Accumulator",
The "Exide", "Hycap-Exide", "Thin-Exide" and "Ironclad Exide" Batteries

New York Boston Chicago
St. Louis Cleveland Atlanta Detroit

PHILADELPHIA, PA.
1888-1912

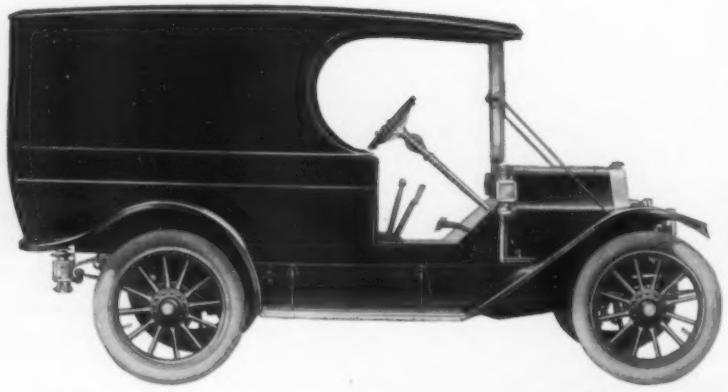
Denver San Francisco Seattle
Los Angeles Portland, Ore. Toronto

Overland

Two New Delivery Cars

Model 59

These delivery models carry bodies of ample dimensions. Each is handsomely finished and has a carrying capacity of 800 pounds. The "Special" is accessible by two large doors at rear, extending full height.



MODEL 59 DELIVERY "SPECIAL." PRICE, $1000

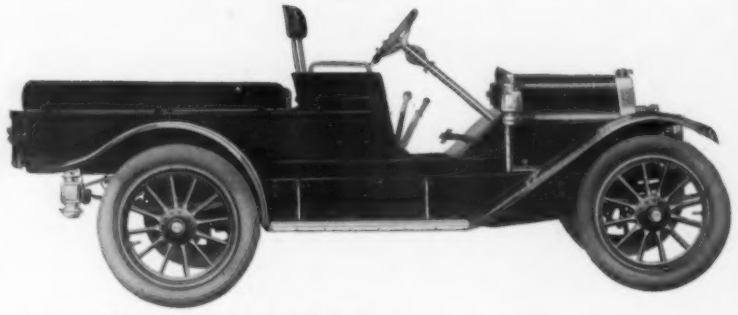
BODY SPECIFICATIONS

Length of floor - - - - 60"
Width of floor - - - - 43"
Height from floor to top - 53"
Tires - - - - - 33" x 4"
Color: Maroon with black trimmings.

MODEL 59 DELIVERY "EXPRESS." PRICE, $950

BODY SPECIFICATIONS

Length of floor - - - - 67"
Width of floor - - - - 42"
Height of side - - - - 10"
Width of side wings - - 6"
Tires - - - - - 33" x 4"
Color: Overland blue with gold trimmings.



Specifications of Chassis

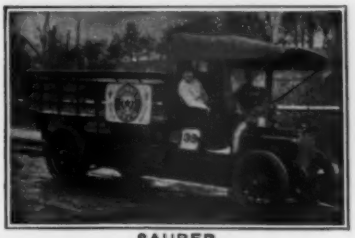
Wheel Base—106 inches.
Tread—56 inches.
Motor—4 x 4½.
Horse-Power—30
Transmission—Selective, three speeds and reverse.
Clutch—Cone.
Ignition—Dual, Splitdorf magneto and batteries.
Brakes—On rear wheels, 2 inches wide, 10-inch drums, internal expanding, external contracting.
Springs—1¾ inches wide, semi-elliptic front, three-quarter elliptic rear.
Steering Gear—Worm and worm gear adjustable, 16-in. wheel.
Front Axle—Drop forged I-section.
Rear Axle—Semi-floating.
Wheels—Artillery wood, 12 1½-inch spokes, 12 bolts each wheel.
Frame—Pressed steel.
Finish—Overland blue.
Equipment—Three oil lamps, two gas lamps and generator.
Tools—Complete set.

Write for a catalogue. Please ask for Book N-48

The Willys-Overland Co. **Toledo, Ohio**

MACK

COMMER



SAURER

POLACK TYRES

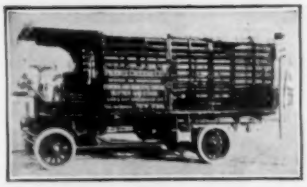
10,000 MILES
CONTINUOUS SERVICE

POLACK TYRES

GARFORD

POLACK TYRES give a greater continuous mileage than any other truck tyre manufactured.

ALCO



KNOX

POLACK TYRES have the maximum resiliency and will reduce your expense for mechanical repairs.

PACKARD

GENERAL VEHICLE

POLACK TYRE & RUBBER COMPANY

Main Offices:

Ehret Bldg., Broadway and 59th St.
New York City

BRANCHES:

146 Summer St. Boston, Mass.
1114 Michigan Ave., Chicago, Ill.
247 Jefferson Ave., Detroit, Mich.
512 Mission St., San Francisco, Cal.
516 Parkway Building, Philadelphia, Pa.
505 Liberty Ave., Pittsburgh, Pa.
917 First Ave., So. Minneapolis, Minn.
930 South Main St., Los Angeles, Cal.
915 E. 15th St., Kansas City, Mo.
Petty Tire & Rubber Co., St. Louis, Mo.

GRAMM

Use them on your Electric Truck and increase its battery efficiency and thereby the radius of operation.

Use them on your Gasoline Truck and keep it on the road earning money instead of in the repair shop losing money.

PIERCE-ARROW

COMMER

YOU bought trucks because of their economy—Why not increase their economy still more by using a

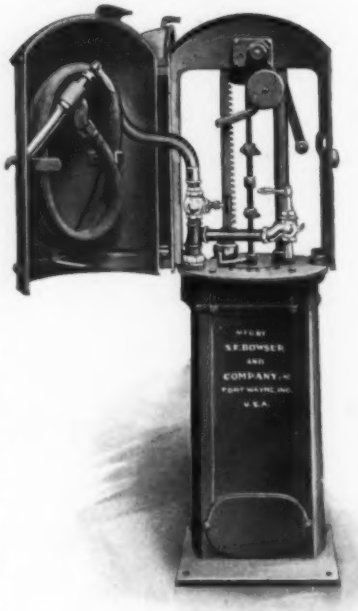
Bowser Gasolene System With Enclosed Pump?

Save yourself the back-straining, wasteful and dangerous task of carrying gasolene to the truck or the trouble of getting the truck in and out of the garage.

No Waste—Danger or loss from any source

Keeps absolute record of gasolene used by each truck.

The Bowser Enclosed Pump is connected to a galvanized steel underground tank. It can be located at any convenient place outside or inside the garage. Enclosed in a heavy cast-iron cabinet with double swing doors that lock, thoroughly protecting it from meddling and the weather.



Its substantial construction makes it equally valuable for indoor installation.

The pump includes the latest centrifugal filter—ten thousand gallon meter which records all the gasolene drawn—a length of special gasolene hose terminating in a portable nozzle strainer.

Investigate this ***Bowser System*** *today. Ask us for details. Send for catalog No.* 11.

S. F. BOWSER & CO., Inc.

Fort Wayne, Indiana

NEW YORK ATLANTA BOSTON DALLAS PHILADELPHIA SAN FRANCISCO MINNEAPOLIS CHICAGO ST. LOUIS TORONTO

Manufacturers of standard self-measuring hand and power-driven pumps, oil and gasolene storage systems, tanks, oil-filtration and circulation systems, self-registering pipe line measures, etc. Established 1885.

The Best Arguments for the Federal Are the Tributes of Federal Users

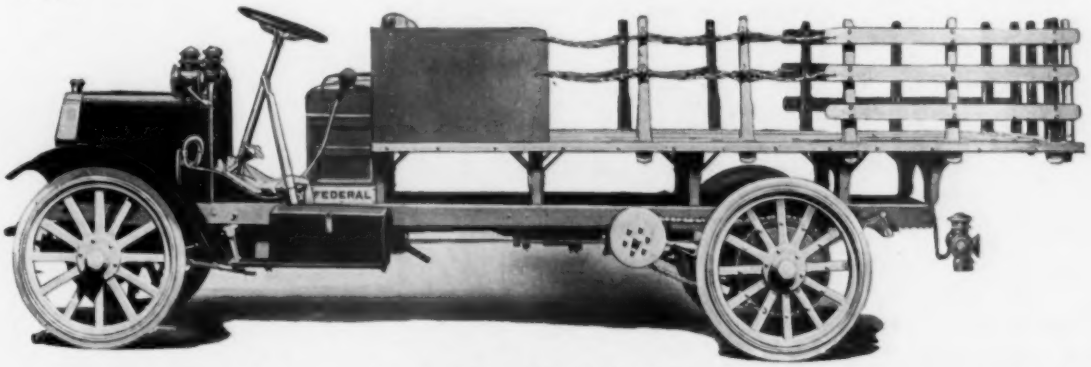
Page & Son, of Portland, Ore., Say:

"We have in use one of your Federal Trucks. It has averaged about twenty-five miles per day, six days in the week, for over a year. There have been no repairs of any kind on the machine except where the fenders have been bent, or where the truck had been scratched from teams backing into it. Therefore, practically the only expense has been gasoline and oil, and your agents here have, from time to time, looked the machine over and if anything was necessary to adjust, it has been done without charge to us. We highly recommend the car and have been the means of urging several others to use the same car, on the strength of the excellent results we have had from the Federal truck."

The Coast Manufacturing & Supply Co., of Oakland, Cal., Says:

"We beg to reply to your favor of the 14th inst., regarding the service we are receiving from the one-ton Federal Motor Truck which we have had in service for somewhat over a year.

In a former letter we stated to you the excellent service it was giving and can now say that the up-keep has been practically *nil*, and there has never been a time that the truck has not been available for service since we purchased it from your agent in San Francisco."



The St. Louis Brass Mfg. Co., says:

"To your recent letter making inquiry regarding service we were having from the Federal Truck which we have had in service for the last 14 months, we are pleased to advise that we are entirely satisfied with the truck and believe it is the best proposition offered at the price.

"We have given our truck hard use and feel that it is a well built and carefully planned outfit."

Standard One-Ton Federal Truck

Chassis, including seat, $1800. Body type at purchaser's option. Wheelbase, optional, 110-inch or 144-inch. Motor, 4-cylinder, 30-horsepower; Magneto, high-tension; Clutch, 16-inch cone; Transmission, three speeds forward and reverse; Hyatt high-duty bearings; Tires, solid, 36 x 3½-inch front and 36 x 4-inch rear.

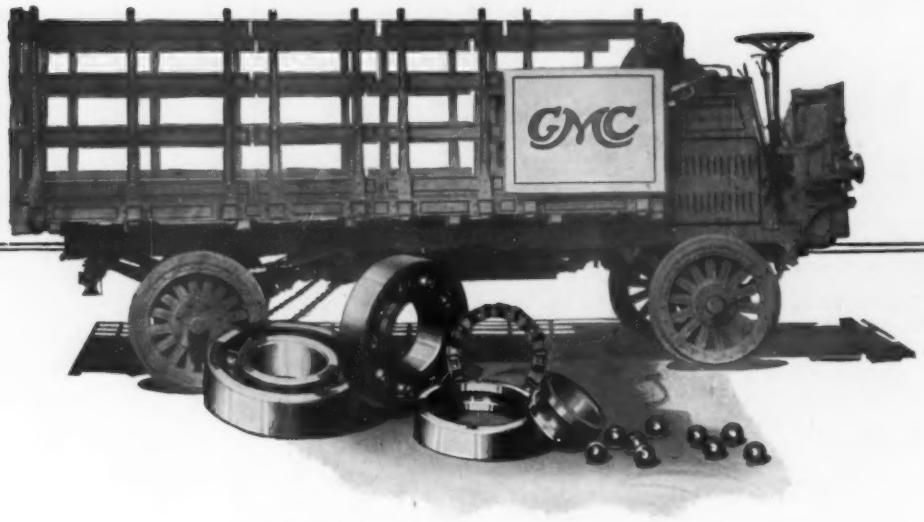
THE FEDERAL
ONE-TON TRUCK
— $1800 —

The C. H. Bangs Druggists' Fixture Co., of Boston, Mass., says:

"In reply to yours of the 14th, requesting information as to whether the Federal Truck we purchased from you is still giving satisfaction, will say that it is certainly continuing to do good work and we believe it would be very hard for us to carry on our business without its help. We have never figured closely what it has saved us, in actual dollars and cents, over horse delivery, but we believe that it has easily paid for itself in the time we have had it in service."

This is the evidence of business men, your customers and your competitors, who have invested money in the Federal Truck to make money. Is it conclusive?

Federal Motor Truck Company New Factory, Dept. A Campbell and Leavitt Avenues **Detroit, Mich.**



GENERAL MOTORS CO., 3½ TON TRUCK

The Mark of a Durable Car

The longer each running part of a car lasts, the lower is the maintenance expense. If nothing wore out the car would last forever.

Some parts, such as the valves and the tires, necessarily demand somewhat frequent attention. Others last longer or not so long, according to their materials and workmanship.

If the bearings last for 50,000 miles they are eliminated from the expense account for that length of time. If they last 25,000 miles, not only the bearings but the labor of replacing them must be paid for twice as often.

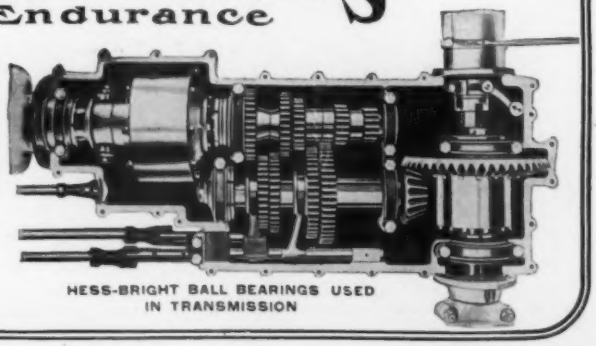
For like size and power the most economical car is the one whose various running parts last as long as possible with the least attention.

Size for size and power for power, most of the genuinely economical cars —the durable cars—have

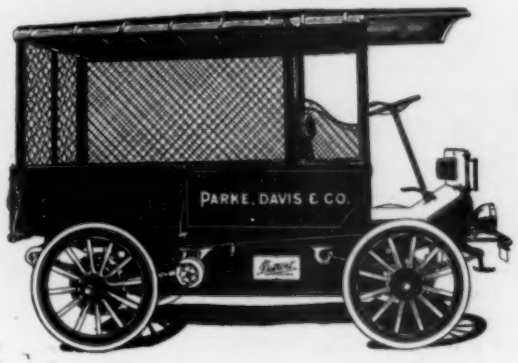
HESS-BRIGHT BALL BEARINGS
Built for Endurance

They are the longest-lived ball bearings made. The highest in first price, they are by far the cheapest in the end.

THE HESS-BRIGHT MANUFACTURING COMPANY
41 East Erie Avenue, Philadelphia, Pa.



HESS-BRIGHT BALL BEARINGS USED IN TRANSMISSION



Used in 54 Lines of Business

Agricultural College	Electric Light & Power Co.	Jewelry
Baggage and Trucking	Electric Railways	Knitting Mills
Bakery	Electric Sign Companies	Leather Goods
Breweries	Express Companies	Mail Service
Casket Mfg.	Fish Markets	Mattress Mfg.
Catering	Florists	Mineral Water Co.
Cemeteries	Flour Mills	Music Stores
China (Wholesale)	Furniture	Newspapers
Cigar Mfg.	Furriers	Paint and Glass
Club 'Bus.	Gents' Furnishings	Packing Co.
Cold Storage	Glass Mfg.	Paper
Confectionery	Groceries (Retail)	Plows
Creamery	Groceries (Wholesale)	Posting Service
Department Stores	Hardware Mfg.	Poultry
Distilleries	Heavy Chemicals	Silk Dyeing Co.
Drugs and Drug Mfgs.	Hospitals	Tobacco Factory
Dry Goods (Wholesale)	Hotel 'Bus.	U. S. Arsenal
Dry Goods (Retail)	Ice Cream Mfg.	Restaurant

Commercial THE Detroit ELECTRIC **Vehicles**

DETROIT ELECTRIC COMMERCIAL VEHICLES are now in daily use in fifty-six (56) of the largest American and foreign cities. Fifty-four (54) different lines of business are represented.

In nearly every instance where these cars have been in service for any length of time, we have received re-orders.

Detroit Electric Commercial Vehicles are noiseless, odorless, trim in appearance and particularly appreciated by customers in all residential districts. They are admitted at all wharves and freight terminals.

It has been proven that electrically-driven commercial vehicles are the only ideal mode of delivery for city and suburban use.

Wherever electricity has solved any problem, it has done so better than any other form of power.

Detroit Electric Commercial Vehicles "get away" instantly in congested traffic. All speeds are controlled with one lever. Any ordinary driver can learn to operate a Detroit Electric. No expert care is necessary. There is no complex mechanism to be put out of order by abuse or carelessness. When the car stops, the power stops—and the expense for power.

Detroit Electric Commercial Vehicles are Edison-Battery-equipped, which is your insurance against high depreciation and annoyances in maintaining the source of power.

The saving which would be effected by the use of the cheapest and most readily adapted form of power in existence, is made possible for you through the use of Detroit Electric Commercial Vehicles.

48-page catalog with full information sent upon request. Specific information regarding your individual requirements gladly furnished.

Detroit Electric Commercial Vehicles are in use in 56 of the largest foreign and American cities

Akron, Ohio	Kansas City, Mo.	Paris, France
Boston, Mass.	Los Angeles, Cal.	Paterson, N. J.
Bridgeport, Conn.	La Crosse, Wis.	Peoria, Ill.
Brockton, Mass.	Lansing, Mich.	Portland, Ore.
Brooklyn, N. Y.	London, Eng.	Richmond, Va.
Buffalo, N. Y.	Lowell, Mass.	Sacramento, Cal.
Calgary, Alta. Can.	Memphis, Tenn.	San Francisco, Cal.
Cedar Rapids, Ia;	Middletown, Conn.	Seattle, Wash.
Chicago, Ill.	Milwaukee, Wis.	Shamokin, Pa.
Davenport, Iowa	Minneapolis, Minn.	Springfield, Mass.
Denver, Colo.	Montreal, Que.	Stockton, Cal.
Des Moines, Iowa	Muncie, Ind.	Tacoma, Wash.
Detroit, Mich.	Muskogee, Okla.	Toronto, Can
Elmira, N. Y.	Newark, N. J.	Victoria, B. C.
Green Bay, Wis.	New Haven, Conn.	Washington, D. C.
Hartford, Conn	New York City, N. Y.	Watsonville, Cal.
Holyoke, Mass.	Norwich, Conn.	Winnipeg, Man.
Houston, Tex.	Oakland, Cal.	Worcester, Mass.
Indianapolis, Ind.	Ottawa, Can.	

ANDERSON ELECTRIC CAR COMPANY

456 Clay Ave., Detroit, U. S. A.

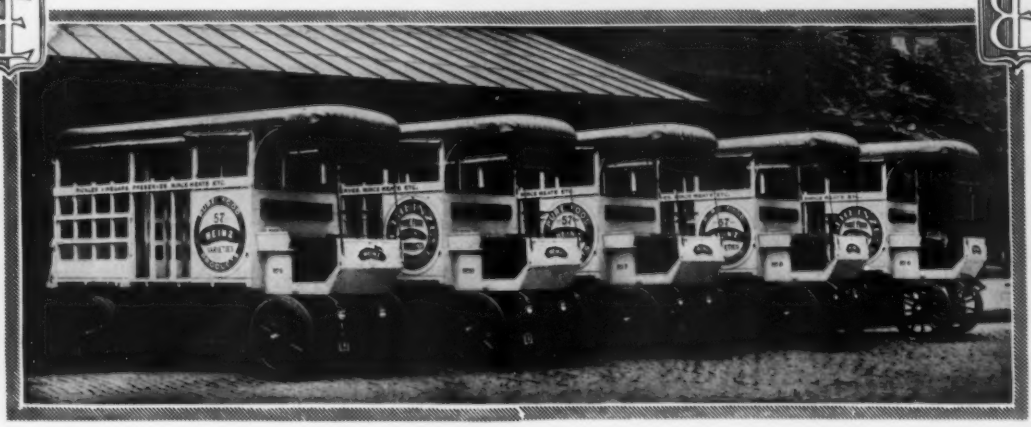
Branches:

Brooklyn
Buffalo
Cleveland

New York: Broadway at 80th Street Chicago: 2416 Michigan Avenue
(Also Branch at Evanston, Ill.)

Kansas City
Minneapolis
St. Louis

Selling representatives in most leading cities



Baker Electrics
COMMERCIAL CARS

Baker Trucks Chosen to Increase Efficiency and Raise Equipment Standards

These Baker Trucks recently installed by the Heinz Company are attracting marked attention by reason of their striking appearance—apple green chassis, body of white enamel and trimmings of black and gold. They have proved the unusual advertising value of high grade motor truck equipment.

The Heinz Company has always maintained a very high standard for all its equipment. In view of this fact, its choice of Baker Electric Trucks is significant.

Low cost of upkeep, increased mileage, greater efficiency, and superior construction of the Baker were features which accorded with the ideas of the company's experts as to the essential requirements of an electric truck and led to their decision in favor of the Baker.

The Baker Bureau will furnish you reliable cost figures covering electric truck equipment suitable for your business.

THE BAKER MOTOR-VEHICLE CO. Commercial Car Department

72 West 80th Street, Cleveland, Ohio *Dealers in Leading Cities*

Oldest and Largest Manufacturers of Electric Vehicles in the World

Stewart
Delivery Cars

Chassis, $1650

Stock Bodies

Panel Body, $150
Express Body with top, $125
Open Box Body with Cape top, $125
Special Express, with wire grating, $150
Undertakers' $550

Stewart Delivery Car—Panel Body Type
Capacity, 1500 Pounds

Announcement

A New, Big, High-Grade Delivery Car Built by Experienced Makers and Selling at a Moderate Price

WE announce the new Stewart delivery car—big, roomy, up-to-date, high grade in construction and with more desirable standard features than any other ever offered at the price. A car manufactured by a well-organized, amply financed, thoroughly experienced company. Note these striking features of this new car, every one of well-proven merit:

Continental Motor—long stroke, 30 H. P., 3¾" bore x 5¼" stroke, three-bearing crank shaft, cylinders en bloc.

Brown-Lipe Transmission—Selective sliding gear type, recognized everywhere as the best. Safety latch on reverse.

Special Timken Axles (front and rear)—Timken roller bearings are used throughout running gear and transmission, everywhere but in the motor.

All other mechanical features of equally recognized quality.

Big Tires—34" x 4", 35" x 4½" rear.

Bodies of New Design, larger than usual, 7-foot loading space.

Wheelbase—126".

Everything Simple and Accessible; all units quickly and easily removable and interchangeable; grease cups throughout; complications eliminated; left-hand steer; center control; driver can enter or leave from either side of car.

The Men Behind

This splendid car is built by men experienced in the delivery car business. T. R. Lippard, president and manager of the Stewart Motor Corporation, was formerly vice president and manager of the Lippard-Steward Motor Car Co. He has had exceptional experience in the manufacturing and selling of motor cars—both pleasure and commercial. He is also well equipped with thorough training in other lines of manufacturing.

R. G. Stewart, designer of the Stewart delivery car and vice president of the corporation, is an engineer of widely recognized ability. He was the designer of the Lippard-Stewart car. Prior to this he was connected for years with such concerns as the Olds Motor Works, the Franklin Automobile Company and others. The Stewart car, his latest achievement, represents the climax of his wide experience.

Pioneers in Field

Messrs. Lippard and Stewart were the first to put on the market a thoroughly high-grade, scientifically perfected light delivery car at a medium price—in fact, at any price.

They have organized the new company to manufacture such cars—greatly improved—on an extensive scale.

The Stewart Motor Corporation, though newly organized, is manned in every department by well-trained, competent men. It has started into business on a greatly enlarged scale—with ample factory equipment and facilities for turning out a large output.

Dealers Wanted

Big successes are being made and will continue to be made in the commercial car field. It offers the greatest money-making possibilities in the motor car business. No seasons. No trading. No yearly models. No expensive establishment. You can sell merchants from three to ten delivery cars with no more effort than it takes to sell one touring car.

Here is a delivery car—the Stewart—that offers unequalled selling possibilities for live dealers. Never before has there been such a demand on the part of merchants for a high-grade, scientifically designed delivery car.

They are through experimenting with converted touring cars. They have learned that only well-made, high-grade delivery cars will stand up. They are already convinced of the value of motor delivery. Now they want to find the right car.

The STEWART ideally fills this waiting demand.

Send in the Coupon

We want live dealers—lots of them. We have a proposition that will make money for you. Our terms are most attractive. Our cars are easy to sell.

Write for our catalog and dealership proposition. Send in the coupon today before someone else gets the desirable territories.

Stewart Motor Corporation, Buffalo, N. Y.
Randall and Superior Sts.

Please send your catalog and dealership proposition.

Name . . . . . .
Street . . . . . .
City . . . . . State . . . . . .

CCJ

Stewart Motor Corporation, Buffalo, N.Y.

T. R. Lippard, Pres. and Mgr. R. G. Stewart, Vice Pres. and Chief Eng. R. P. Lentz, Sec. and Treas. Robt. W. Ingersoll, Sales Mgr.

Separate from and having no connection with Lippard-Stewart Motor Car Co.

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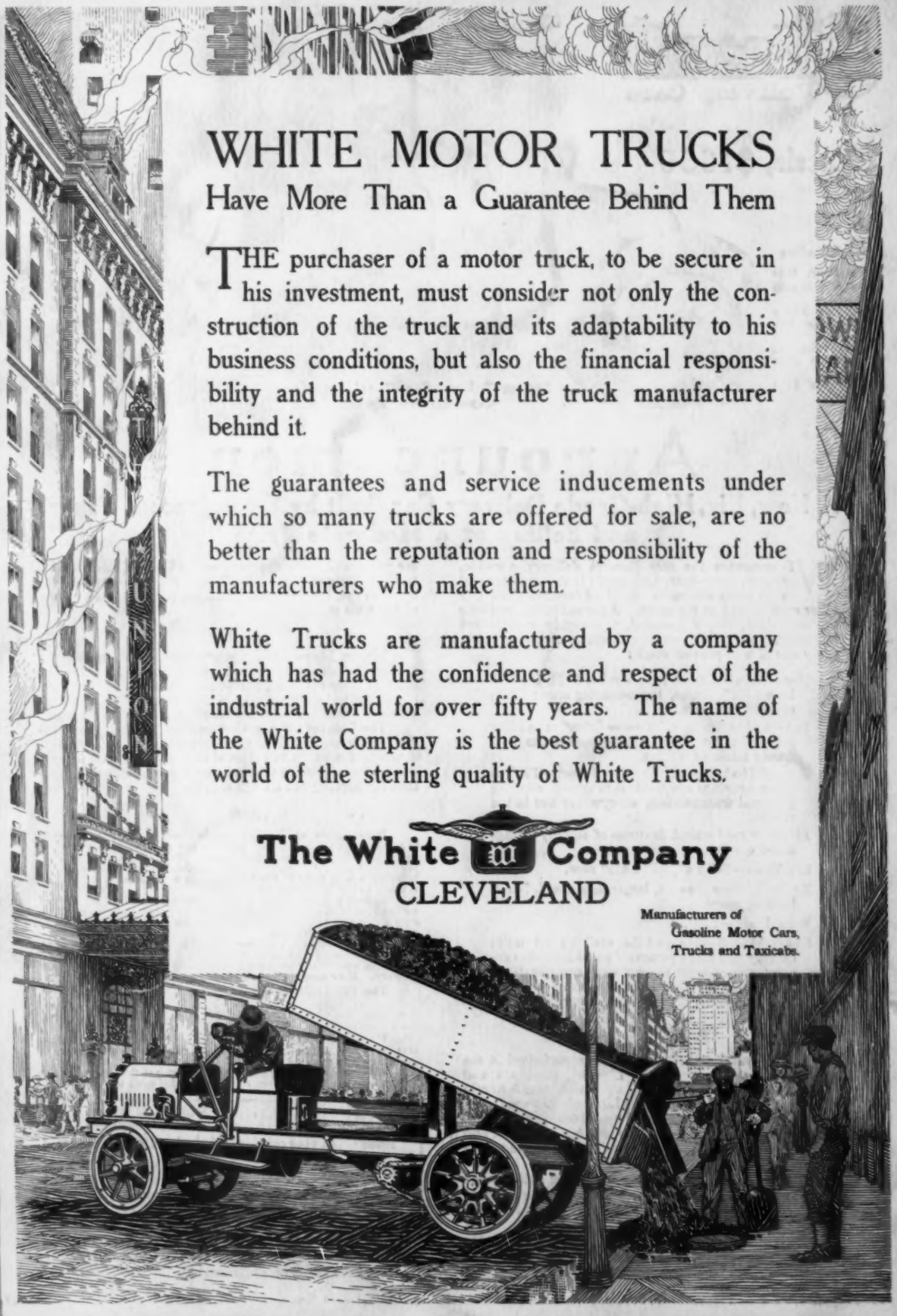

WHITE MOTOR TRUCKS

Have More Than a Guarantee Behind Them

THE purchaser of a motor truck, to be secure in his investment, must consider not only the construction of the truck and its adaptability to his business conditions, but also the financial responsibility and the integrity of the truck manufacturer behind it.

The guarantees and service inducements under which so many trucks are offered for sale, are no better than the reputation and responsibility of the manufacturers who make them.

White Trucks are manufactured by a company which has had the confidence and respect of the industrial world for over fifty years. The name of the White Company is the best guarantee in the world of the sterling quality of White Trucks.

The White Company

CLEVELAND

Manufacturers of
Gasoline Motor Cars,
Trucks and Taxicabs.

LB S '14